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MICHAEL HEILPRIN AND HIS SONS

BOOKS BY THE SAME AUTHOR

FRANZ GRILLPARZER
AND THE AUSTRIAN DRAMA

THE HYGIENE OF THE SOUL: THE MEMOIR
OF A PHYSICIAN AND PHILOSOPHER

PRIN

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TO

THE YOUNGER GENERATIONS

AND ESPECIALLY

MY DEAR GRANDCHILDREN

WHOSE FUTURE I FONDLY HOPE

WILL BEAR THE IMPRESS OF THE PAST

DESCRIBED IN THESE PAGES

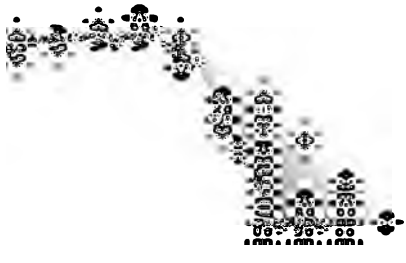
G. P.

PREFACE

SHORTLY after the death of Michael Heilprin, in 1888, I planned, with the cordial appoval of Mr. W. P. Garrison, then editor of the New York *Nation*, to collect into a volume some of the articles contributed to that journal by Mr. Heilprin. The plan was not carried out, and fate has decreed that I should now, in writing of the father, commemorate also the lives of his sons, Louis and Angelo. Time, I am convinced, has detracted nothing from the value of what, in this volume, has been included from the contributions of Michael Heilprin to the columns of the *Nation* and the *Evening Post*. The proprietors of these journals have kindly permitted the full use of their files.

I acknowledge also, with thanks, the permission given me by Messrs. D. Appleton & Co. to reprint extracts from the "American Cyclopædia," the "Historical Reference Book," "Alaska and the Klondike," and from *Appleton's Popular Science Monthly;* and by J. B. Lippincott Co. to quote certain passages from "Mont Pelée and the Tragedy of Martinique." I am under similar obligations to Messrs. G. P. Putnam's Sons for permission to reprint the article on "The Geographical Conquests of the Century" (published by them in their volume on "The Century's Progress," by arrangement with the proprietors of the *Evening Post*); and to the publishers of *The Forum* and *The Engineering Magazine* for the use of the articles quoted from these periodicals in this book.

GUSTAV POLLAK.



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Part I

MICHAEL HEILPRIN

MICHAEL HEILPRIN

I

A BRIEF SKETCH OF HIS LIFE

On the tenth of May, 1888, there died at Summit, N. J., a man little known to the world at large, but of unique reputation among the learned few. His character and his achievements called forth glowing encomiums from those best qualified to appreciate him. The fullest of these tributes was from the pen of John W. Chadwick, a distinguished Unitarian clergyman and an author of note. The article appeared in the *Unitarian Review* for September, 1888, and is here reprinted, with the correction of a few errors in date.

"Michael Heilprin: a noble scholar. It was my privilege to call this man my friend, to receive from him an esteem and affection which I could never understand, but which made me worthier of them than I should otherwise have been. Therefore, I come to speak his praises now that he is dead. It is always fit and pleasant to give honor where it is due. It is never more so than when the good we celebrate was cloistered from the world, or when the work was known and held in due respect while still the workman was withdrawn from public view. With Mr. Heilprin it was so to a very great extent. His literary labors were for the most part anonymous. The only exception was his *Historical Poetry of the Ancient Hebrews*. His terrible toil on Appleton's Cyclopædia was justly prized by the publishers and editors of that admirable work; but its amount and character were known to few, — only to his immediate coadjutors and personal friends. The same is true of his critical work upon the *Nation*, which began with its fourth number and continued for more than twenty years. Many thousands have read his articles

with admiration who had not the faintest idea of the personality of their benefactor. It is not often that so much of intellectual power is exercised in this impersonal way. He was well satisfied to have it so. Not that he was indifferent to the good opinion of his friends and those who were well qualified to judge his work, but to do it honestly and well was ever his main source of satisfaction. For general fame or reputation he had little care. This disposition is ever an encouragement to our praises of the men of parts and character whom it adorns.

Though I knew Mr. Heilprin well for many years, he was ever slow to talk about himself; and I must rely upon a friendly hand, incapable of erring in such matters, for the particulars of his earlier life. He was born in Piotrkow, in Russian Poland, in 1823, inheriting the aptitude of a long line of Hebrew scholars, the earliest upon the list in the catalogue of the British Museum writing in 1558. His father, Phineas Mendel Heilprin, who, sharing the fortunes of his son, died in Washington, D. C., in 1863, was a merchant-scholar in the manufacturing town of Tomaszow, where Mr. Heilprin spent his youth. The father, engaging in the business of the place, was a Hebrew scholar of high rank and an ardent student of Maimonides, yet not less of Kant and Fichte and other philosophers of the Gentile schools. Michael began the study of Hebrew, as did his playmates generally among the Polish Jews, at the age of four or five. He never at any time was sent to school or had any teacher except his father. German was his mother tongue; but, when still a boy, he obtained a perfect mastery of the Polish language. He studied simultaneously Latin, Greek, and French, rising regularly every morning at two o'clock and settling down immediately to his books. From an early period, the grandeur of Hebrew poetry and the difficulties of Hebrew grammar had much more attraction for him than Talmudic subtleties. In his own unconventional way, he became the instructor of his brother and a sister, and when about fifteen collected around him a number of equally youthful disciples. To 'take and give not on again' was never satisfactory to him; but, if ever at any time his manner was didactic or pedagogical, it had ceased to be so in his full maturity. While still a boy, his mental outlook was enlarged by visits to Prussia with his father; and his linguistic

attainments began to attract the attention of distinguished Hebraists. Already he had begun the study of comparative philology, making careful notes of his own observations. In after life, he retained lively recollections of the Polish insurrection of 1830–31, and of his growing sense of the oppression of the Russian yoke. This came at length to be so unbearable that in 1842 his parents sought a refuge from it in Hungary, and he went with them and his young wife; for, though but twenty years of age, he was already married.

For two years after his arrival in Hungary he devoted himself to the study of the language, history, and institutions of his new home. The great national liberal movement, under the leadership of Széchényi, Eötvös, Deák, and Kossuth, was then well under way; and Mr. Heilprin was pledged by his experience in Poland and by his recent studies to unite himself with this. He established a bookstore in Miskolcz (which is still flourishing); and, coming much in contact with the Hungarian gentry, he soon enjoyed their merited esteem so much that, though he was still wearing the peculiar costume of a Polish Jew, he was received into the local club of nobles. When the revolution of 1848 broke out, his reputation as a writer was established, and his revolutionary poems were widely popular. He was offered and accepted the position of secretary to the literary bureau attached to the department of the interior. After the proclamation of Hungarian independence in 1849, he followed the government to Debreczin, and back to Pesth and to Szegedin, when the exigencies of war necessitated these removals of head-quarters from place to place. The revolution soon collapsed, inherent weakness co-operating with the basest treachery to this end; and Mr. Heilprin barely escaped capture by the Austrians. After remaining in concealment for some months, he succeeded in making his escape, and went to Paris. There began that failure of his eyesight which obliged him finally to rely very largely upon others' reading for the acquisition of his stores of information. This great misfortune had its compensations. It made the studies, which might otherwise have isolated him, a bond of union between him and the members of his family. Unable to obtain in France the means of livelihood, — especially with failing sight, — the rigor of the Austrian authorities having some-

what relaxed, he resolved to run the risk of returning to Hungary. His six months in France were not wholly lost. He made a long pedestrian excursion, following the river Loire. It was one of many that renewed his youth from year to year. No sturdier walker could be found, nor one who more enjoyed perambulation. Another pleasure which he had in France was in attending the lectures at the Sorbonne of Michelet, Jules Simon, and others.

Even before returning to Hungary, Mr. Heilprin had resolved to seek a home in England or the United States; and, while teaching school in Ujhely, he addressed himself ardently to the study of the English language, so that when he finally left Hungary, in 1856, he had thoroughly mastered it. His principal text-book was Gibbon's *Decline and Fall.* He scrupulously fixed the pronunciation of every doubtful word, and identified on the map every locality mentioned in the work. Going to England, he again met Kossuth, who gave him a letter of introduction to Mr. Seward, which he never used. It was the advice of Rev. William Henry Channing that determined him to come to America; and it was among his friends in Brooklyn, N. Y., that he ultimately found some of the most kind and faithful of his own, — Mr. R. H. Manning, his wife, and sister Elizabeth, with whom Margaret Fuller had spent a happy season of some months' duration just before starting on that journey which had no return. When Mr. Heilprin came to this country, other Hungarian exiles were already here, — among them two sisters of Kossuth, and one of these, Madame Zulavski, had tender nursing under Mr. Manning's roof until her death, when, at her burial, Mr. Heilprin spoke the gratitude of the exiles to the Manning household, ever a fountain-head of kindly offices to those in need of them.

It was a precarious living that he earned by teaching until 1858, when his connection began with Appleton's New American Cyclopædia. It was then in its third volume; and at his first meeting with the editors, Messrs. Ripley and Dana, he so impressed them with the extent and accuracy of his scholarship that he was at once intrusted with the revision of all the geographical, historical, and biographical articles. He himself wrote many of these articles, that on 'Hebrews' being one of the most notable. His contributions generally were such as gave

attention to subjects which, but for him, would have been overlooked. But his greatest service to this work, for which he cherished an affectionate interest only equalled by his interest in the *Nation*, was on the lines of verification and unification. It is safe to say, as has been said already, that 'no other similar work of collaboration published in the English language has ever had this merit in so high a degree, — in which, for example, there was a uniform spelling of proper names, a uniform date for the same event, however often mentioned, a uniform system of transcribing words (especially proper names) from foreign languages not using the Roman alphabet.' His work on the first edition ended in 1863; and began on the second, much revised, in 1871 and ended in 1876. Other work of a similar character engaged him further on, and close akin to it were his articles in the *Tribune* or the *Nation* reviewing works of an encyclopedic character. Reviewing in the *Tribune*[1] a certain biographical dictionary, complete in one volume, he ventured the statement that it could be convicted of five thousand errors; and he never would have ventured it if he had not been sure that he could make it good. His reviews of the Encyclopædia Britannica in the *Nation*, as volume after volume came out, revealed at once the breadth and accuracy of his own knowledge and the surprising carelessness of the editing under consideration.

Mr. Heilprin's connection with the *Nation* began in 1865, and hardly ended with his death; for it may be assumed that in more than one careful article in that journal we shall yet be able to detect the impress of his hand. His work for it was not only of the kind which has been specified, but ranged through a wide field of critical and historical subjects. He had hardly been a month in America when Sumner was struck down by Brooks; and the anti-slavery conflict, in full career, convinced him that human rights had not all been fully established in America. He recognized but one great battle here and in Hungary, and his sympathies with the anti-slavery party from the first were keen and strong. In 1860, he wrote an elaborate article in the *Tribune*, demolishing a Jewish rabbi, who had come to the rescue of slavery with an army of Bible texts. But, while always deeply interested in our politics and reforms, his writing for the *Nation*

[1] This is an error. For *Tribune* read *Nation*.

was mainly upon European literature and politics or in review of American works that dealt with these. He was especially at home in all the ins and outs of the Eastern question, and probably did more to diffuse sound information and create just opinion on the Bulgarian and kindred complications than any other writer in this country. His affection for the *Nation* was remarkable; so was his jealousy for its good name. Writing for it anonymously, its reputation for accuracy was to him a constant inspiration; and an error in any part of it hurt him almost as if it were his own. It was well for it that he was sympathetic with its principles; for he would never write for any journal, even on literary subjects, with whose principles he disagreed.

From 1858 to 1863, Mr. Heilprin resided in Brooklyn, in close association with the exiled members of Kossuth's family. From 1863 to 1865, he was in Washington, following the fortunes of the war with intense interest, and acquiring a knowledge of its details that was afterwards of incalculable benefit to him in the revision of the Cyclopædia. The restoration of the political liberties of Hungary, which failed to satisfy Kossuth, was to him a source of great encouragement and joy. Francis Deák, who had brought about the new order of things in Austria-Hungary, ever remained his ideal statesman. He was not unlike him in his absolute integrity, his simplicity and fairness, and the convincing logic of his argument. Had he chosen to return to Hungary, as did many of his fellow-exiles after 1867, he would undoubtedly have achieved distinction in the political history of the United Empire. But, if Hungary was his first adopted country, America was his second; and his work here had now become so happy and assured that he did not care to break it off.

Through all his editorial and journalistic work, Mr. Heilprin had kept a roomy corner in his mind — the corner next his heart — for his Old Testament studies; and, when the revision of the Cyclopædia was completed in 1876, he began to put his studies into literary form, and in 1879 published the first, and in 1880 the second, volume of his *Historical Poetry of the Ancient Hebrews*. At an early age, he had made himself familiar with the course to date of modern criticism of the Old Testa-

ment; and of every subsequent stage he had kept himself thoroughly informed. He had accepted, not grudgingly, but with enthusiasm and delight, those views of the Old Testament which have been developed by Graf and Kuenen and Wellhausen and Reuss (central to which is the assignment of the Levitical portions of the Pentateuch to the fifth century B. C.); and his sympathetic criticisms of their studies in the *Nation* from time to time have been an important factor in familiarizing American scholars and readers with them. But he was a slavish follower of none of these distinguished men. In his *Historical Poetry of the Ancient Hebrews* there are many novel points of view, many original constructions of the text and of the *tendency* of various documents. His translations of the poems and fragments attested equally his familiarity with Hebrew and English. For vigor and for beauty, they are alike remarkable, so that it is not difficult to appreciate the fact that, as a poet, he first won his literary reputation. A third volume, interrupted by his death, contains, we have reason to believe from his confidential communications, matter of uncommon interest. Its completion was retarded by his interest in the Jewish refugees who were driven by Russian persecution to our shores a few years ago. His interest in these was not that of a Jewish sectary, which he had long ceased to be, but was partly inspired by loyalty to his own race, partly and mainly by his sensibility to every outrage and indignity offered to his fellow-men. But, in spite of his untiring zeal and self-sacrificing devotion, the attempt to establish colonies in Oregon, Dakota, and New Jersey was very disappointing, mainly because of inadequate financial support.

Mr. Heilprin's knowledge of history was nothing less than an epitome of its universal course. His stomach for facts was something wonderful. His command of dates was by tens of thousands. His accuracy was equal to his range. He would run his eye along the pages of a dictionary of dates, and make corrections by the half-dozen or the dozen upon every page. The time and place of the six hundred battles and engagements of our Civil War were all at his tongue's end. Even Macaulay could not 'say his popes,' fearing he might be slaughtered with the Innocents; but it may well be doubted if Mr. Heilprin would have failed in the attempt. His confidence in his memory was

very great, and he wrote the most elaborate historical reviews without a particle of special preparation. This is an easy thing to do where one gets all his knowledge from the book in hand. But this Mr. Heilprin never did. For example, I recall a review of the voluminous memoirs of Metternich. It was written from the stand-point of a much wider knowledge than the book involved. It checked and challenged many statements. I asked him how much special preparation it required, and he said, 'None whatever.' So much knowledge of details is generally fatal to the broader view. It was not so with him. His apprehension of the philosophy of history was not less vivid than his apprehension of the concreter elements. He was satisfied with no 'disconnection dull and spiritless.' He was enamoured of the broadest generalizations and the remotest causes of events.

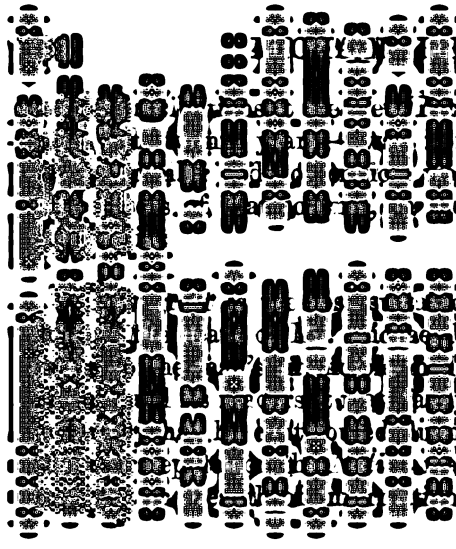
Those who knew Mr. Heilprin only in his writings did not half know him. There was nothing specially attractive in his style. It was simple and transparent, and never faulty in its grammar. But his conversation was phenomenal. His speech was hardly adequate to express the crowd of his ideas. The appearance of a slight impediment arose (so he explained) from his thinking with equal ease in several different languages, while to make choice in which to speak was sometimes difficult. Those who have read his *Historical Poetry of the Ancient Hebrews* and who have heard him talk on the same subject will bear me witness that the book is nothing to the talk. His intellectual enthusiasm was immense, and swept along his hearers in a tumultuous flood. He had a reading knowledge of eighteen different languages, having acquired Roumanian in the last weeks of his life. He could speak eight, if I remember rightly, with sufficient ease. Withal, he was extremely modest. For all his vast acquirements there was never any assumption of extensive knowledge, never, apparently, any consciousness of it. He made it easy for those who knew but little to talk with him. He never reminded them of their ignorance, but gave them credit for much wider knowledge than they had.

The heats of scholarship did not exhaust in him the natural juices of the man. 'Learned in books,' he was not 'little in himself.' The face of nature always had for him delight. He was a man who

'set his face,
In many a solitary place,
Against the wind and open sky.'

For much that he would blot in this article, he would insert that he was a vegetarian from 1850; but he kept the faith in silence, without urging it upon his friends. Perhaps his death at sixty-five argues against the habit of his life. The vigor of his intellect was not at the expense of his affections. His heart was as a little child's. He had great faculty for friendship, was ever loyal and kind, and faithful in the observance of those little offices which the student life may easily obscure; while for his immediate family he seemed to have a heart as free, a care as gentle and deliberate, as if he had no life but that of his own fireside joys. His domestic circle was remarkable for its mutual helpfulness, for its intellectual sympathy, for the delight with which its members encouraged each other in the pursuit of knowledge. Mr. Heilprin lived to see two of his children arriving at distinction in the fields of literature and science; and this was not the least of many satisfactions which rendered his severely simple life one of the most beautiful and enviable that I have ever known."

Such, in brief and substantially correct outlines, was the life of Michael Heilprin. It was my privilege and happiness to be close to him and his sons as a member of the family. They were all three men of rare worth and remarkable endowments. Angelo Heilprin, the younger son, impressed himself upon the scientific world in striking ways, and it is still my hope that some day a memoir worthy of his achievements may be written by a competent hand. For such a memoir, the present volume may furnish material. It is likewise my purpose to dwell on the unique traits of character which distinguished both the father and his sons. Above all, I wish to call attention to the importance of Michael Heilprin's critical writings, which, fully appreciated by chosen scholars, and enjoyed, at the time of their appearance, by a wide circle of readers, are now hidden from the general public. Of Mr. Heilprin's single work in book form, *The Historical Poetry of the Ancient Hebrews,* and other of his writings, mention will be made later on. His literary life-work



ILPRIN

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II

MR. HEILPRIN'S POLITICAL AND CRITICAL ARTICLES IN THE *NATION*

The very first of Mr. Heilprin's contributions to the *Nation*, on "The Crisis in Austria," which appeared in the fourth number of that journal, in July, 1865, convinced the editors that they had found a writer of remarkable insight into foreign politics. The article was a summary, apropos of the fall of the Schmerling ministry in Vienna, of the changes in the Hapsburg monarchy since the revolution of 1848. Persons and events were sketched with a master's hand. The Emperor Ferdinand, Metternich, Bach, Schwarzenberg, Napoleon III., Francis Joseph, the Archduchess Sophia, Bismarck, Count Széchényi, Francis Deák, Count Teleky, Kossuth; the subjugation of Hungary, the policy of centralization in Austria, the tentative constitutional efforts of Schmerling in Vienna, the antagonism between Magyars and Slavs in Hungary, the opposition of Poles and Bohemians to the Germans, the Schleswig-Holstein imbroglio, the disasters of Magenta and Solferino, the Polish insurrection of 1863–64, the inevitable approach of a dualistic experiment for the empire — all this was touched upon with the fullest knowledge and with statesmanlike comprehension.

This article was followed by equally learned reviews of several important French works, — the correspondence between Prince Adam Czartoryski and Alexander I. of Russia, Montalembert's *The Victory of the North in the United States*, and De Tocqueville's eighth volume, dealing with the French Revolution. An extract from the review last named will serve to illustrate Mr. Heilprin's power of graphic condensation:

De Tocqueville

"The new political faith, preached by the Revolution, followed in the wake of the emigration, if it did not precede it. It

is wonderful to observe how easily most of the European nations were persuaded to make those novel ideas, apparently French, their own. General causes had prepared them for it.

But the terror which reigned in France was a peculiar offspring of its time and place. It could nowhere else have the character it there bore. It was the product, it is true, of general causes, but which *local* causes forced beyond all limits; it was the product of the French manners, character, and habits, of French centralization, of the sudden destruction of all hierarchy. Its force lay in powerful organization, in its crushing unity. It could nowhere be imitated with success. To have set a pernicious example to other times and nations is an evil done to posterity by the Convention, which by its ravings did so much evil to the men of its time. Its triumph was made possible by particular domestic and foreign circumstances, which are generally overlooked. It will not always be enough to attempt with violence and temerity what appears impossible. 'The Convention created the policy of the *impossible,* the theory of raving madness, the worship of blind temerity.'

Neither could the wars of the French Revolution be imitated and victory organized accordingly. The circumstance will find no parallel. Democratic armies fought kings, when a democratic revolution was sweeping over Europe. The new world fought the old. Victory was carried by surprise; everything was novel. The spirit of the revolution marched before its martial banners. Devastated Europe aided its ravagers. The new faith, as once Islamism, swept on, ravaging and converting at the same time. Imbecile princes were broken before they knew what was passing around them. A stupefied, servile diplomacy, without unity or harmony, made futile attempts to oppose an unparalleled centralization. An equally servile strategy could as little cope with democratic boldness and impetuosity, which were, besides, revolutionary and French. The defects as well as the good qualities of the French co-operated alike in making them triumphant. . . .

The Revolution continued to advance, to complete its course, after the fall of Robespierre, in spite of reaction, of the succeeding vanishing of illusions, of the exhaustion of the assemblies, and of the drooping of the spirit of freedom, amidst the

growing preponderance of military character. The armies remained energetic when the nation ceased to be so. The war power of France survived the decline and degradation of the civil government, even when the latter had fallen into the contemptible hands of the Directory."

Of De Tocqueville himself Mr. Heilprin drew, in a later article, based on the concluding volume of his collected works, the following portrait:

"It presents to us De Tocqueville, entire, as he was in the period of his maturity and vigor, from the time when he had, as the author of *Democracy in America,* occupied so high a place among the foremost thinkers and writers of the age, almost down to the fatal day — the second of December, 1851 — which sent some of the most active minds of France into an involuntary retirement, in which our philosophic statesman found no rest, but sufficient *otium cum dignitate* to write his *Ancien Régime.* In academical and parliamentary speeches or short addresses, in literary and legislative reports (as for instance on Cherbuliez's *Démocratie en Suisse,* on the abolition of slavery in the French colonies, on prison reform, on the affairs of Algeria, and on the revision of the constitution), and in independent elaborations on penal colonies, on emancipation, on the history of Cherbourg, this volume re-introduces us to De Tocqueville, the writer and orator, philosopher, legislator, and minister of state; the independent enquirer so full of moderation; the aristocrat by birth, habits, and tastes, whose task of life it is to study the laws, and to co-operate in smoothing the ways of political equality; the friend of democracy in the New World who trembles at its advent — under different auspices — in the Old; the son of legitimists, but republican by conviction, who sincerely defends the constitutional throne of Louis Philippe; the staunch partisan of liberty and opponent of centralization who above all abhors demagogism; the zealous advocate of the rights of the poor who sees in socialism the worst kind of servitude; the ardent religionist with whom unlimited freedom of conscience and the separation of church and state are the dearest of political tenets; the Catholic by

education to whom England and the United States are models of a religious society; the man of the minority who is always charitable and gentle in judging the leaders of the majority; the writer and speaker who charms us by his diction without ever sacrificing simplicity or lucidity to flowery ornaments. But it is, we believe, the parliamentary part of the speeches contained in this volume, scanty as it is, which shows him, as a man of active thought, in best relief."

An Article on Persia

The next review, an article on "Persian Characteristics," showed Mr. Heilprin's familiarity with Oriental subjects. He could always present, with rare skill, the essence of the author's work, while letting the light of his own information play upon it.

"Modern Persian literature is decidedly inferior in its products to that of former centuries. There are numberless versifiers, but few poets, and the standard models of the golden age are not even well imitated. Poetry is either a trade or a pastime, never a vocation. The shahs are beset by beggar bards, have their poet-laureates, and make verses themselves. Nasser-ed-din is both a poet and a patron of literature. Children are taught Saadi's *Gulistan,* learning its most striking epigrams by heart. Poems form the principal basis of education. Every respectable conversation must have its rich admixture of spirited or pointed quotations. The precepts of the Koran are studied with less reverence than the teachings of Saadi or Hafiz; its legends are not as well known as the fabulous tales of Firdousi. A good elocution and a fine florid style is what every man of culture tries to acquire; a lucid and chaste diction is rarely to be met with. Caligraphy is the constant study of everybody, from childhood to old age. Letters and notes are written with the utmost care and neatness. Mirzas carry a collection of writing materials attached to their girdle. For fine manuscripts or exquisite writing-samples high, sometimes fabulous, prices are paid. Printed books, in which the peculiar way of writing the Arabic letters cannot well be

imitated, are less valued than well-executed lithographic works. Geography is generally taught according to the old Ptolemaic system; few scholars know its modern developments. Asia is tolerably well known from historical traditions and the experiences of travelling merchants, roving dervishes, and pious pilgrims. Of Europe, only the principal countries are known. History is a most favorite study, though acquired not less superficially. It generally begins with the conquests of Islam. Mirkhond's renowned historical work, *Rutzet es Safe,* is to be found in every respectable house. A continuation to our times has lately been elaborated. Histories of Napoleon, after Scott; of Peter the Great and Charles XII., after Voltaire; and of Czar Nicholas, after Baron Korff, lately issued, are widely and closely studied, sometimes to the perplexity of Europeans, who are surprised to find themselves comparatively ignorant on those topics. Works on mathematical and other scientific subjects also circulate in manuscripts or lithographs. But instruction, in general, is still in a primitive stage, though private schools abound, and almost everybody learns a little, women not excepted."

Reviews of Encyclopædic Works

In the fifteenth number of the *Nation,* that of October 12, 1865, appeared the first of Mr. Heilprin's remarkable series of reviews of encyclopædic works. The wonder at his erudition is enhanced if we remember, as Mr. Chadwick and others have pointed out, that these reviews were always written from a single reading of the contents — sometimes after a rapid glancing at the pages — and that Mr. Heilprin hardly ever found it necessary to refresh his memory by comparing his corrections with standard authorities or books of reference. His accuracy was infallible. In other contributions he had shown a philosopher's grasp of large historic movements; in these was displayed the minute and diversified knowledge of the encyclopædist. The following may serve as a specimen of his reviews of this class:

Cole's "Biographical Dictionary" [1]

This neatly and correctly printed little volume will be found a very useful hand-book, affording "ready information of the births and deaths of deceased persons, more or less noteworthy, of all countries and periods." The author modestly hopes — and we trust his hope will not be deceived — that it will "lie upon the desk, an unobtrusive companion of other books of many sorts, to give a reader its rapid answer whenever he is tempted to pause at a name, and ask no more than 'When did he live?'" This curiosity he satisfies in the plainest and shortest way, generally in a line to a query. The additions attached to the names and dates, which also answer the question "Who was he?" or "What has he done?" are not intended to furnish a condensed biography, but chiefly to identify the individuals. The italics within brackets indicate some production of the pen or some work of art — whenever possible, a *chef d'œuvre;* the italics without brackets indicate a second, an assumed, or an original name. Biographies of the subject are referred to thus: "Life by . . ." or "L. by . . ." When we add that this biographical dictionary contains no less than eighteen thousand names, and that the author has labored with conscientious zeal and rare diligence in verifying his dates, the reader will at once perceive how much benefit he may derive from such a companion of his literary occupations.

On the other hand, we cannot but regret that the author has not also bestowed on his work the attention and labor necessary to make it complete, uniform, and as correct in everything else as it is in dates. His acquaintance with English, French, and classical history and literature, and the use of a number of standard guides to biographical knowledge, have enabled him to perform parts of his task thoroughly and accurately; in others he has been less successful, chiefly from want of discrimination in making the choice of his subjects. While thousands of names given might be eliminated without detriment to the plan of the book, other thousands, of real historical value, are wanted to

[1] "A Brief Biographical Dictionary. Compiled and Arranged by the Rev. Charles Cole, B.A., Trinity College, Cambridge." London and Cambridge: McMillan & Co. 1865.

make it complete. Of this an American reader will easily be convinced, when, after finding on its first page a list of such names as C. C. H. vander Aa, P. vander Aa, N. Aagard, C. Aagard, E. Aalst, W. Aalst, A. Aaron, Aaron Acharon, P. Aarsens, F. van Aarsens, Aartgens, Abano, Abascal, Abate, Abati, Abatini, Abauzit, Abbadie, etc., he will in vain look for the date of birth or death of such Americans of former or recent times as Hancock, Otis, Montgomery, Arnold, Sumpter, Marion, Mercer, Randolph, Benton, Douglas, Perry, John Brown, Foote, Kearney, or Reno. A Pole must be equally surprised not to find the names of such chief representatives of his country's ancient military or literary glory as Chodkiewicz, Zolkiewski, Czarnecki, and Kochanowski, or the names of the (now deceased) principal leaders in the memorable revolution of 1831 — Wysocki, Chlopicki, Dwernicki, Skrzynecki, and Dembinski, whom not even a fifth-rate general history or biographical cyclopædia will pass over in silence. A Hungarian will not only miss the equally renowned heroes and martyrs of his late struggle, Damjanics, Nagy Sándor, Csányi, and Széchényi, but also such old historical names as King John Zápolya, Bocskai, and the elder Zrinyi — the Leonidas of modern times — though he may discover his Hunyady, Tökölyi, and Rákóczy, if he knows that the English persist in calling them Hunniades, Tekeli, and Ragotski. Hardly less grievous is the omission of such modern historical or literary names — Italian, German, Greek, and Servian — as Leopardi, Colletta, Bandiera, and Ruggiero; Schill, Sand, Hebel, Immermann, and Lenau; Odysseus and Miaulis; Czerny George and Milosh. But even of modern French names, in spite of the author's diligent use of both the "Biographie Universelle" and "Nouvelle Biographie Générale," we find such as the following missing: Generals J. B. Cavaignac, M. Dumas, and Dampierre; Grégoire, Decazes, Godefroy Cavaignac, and Proudhon; and the regicides, Louvel, Alibaud, and Fieschi. Jewish history and literature, ancient as well as modern, are altogether very poorly represented. Not only are the non-royal biblical names, as Moses, Joshua, Isaiah, Jeremiah, Ezra, and Nehemiah, as it appears, consistently omitted — for reasons neither stated nor obvious — but also some of the most distinguished post-biblical names

of Hebrew literature, as the Rabbis Solomon Isaaki, Nachmanides, and Solomon-ben-Meir, or the poets, Moses-ben-Ezra, M. H. Luzzato, and Wessely, are not to be found, while others incomparably less important are given.

Ignorance of the Hebrew language on the part of the author, and, probably, also, of his authorities, is the source of several errors. Thus Hillel the Elder is designated *Hassa Ken,* which stands for *Ha-Zaken* or *Haz-Zaken* (Heb., *ha,* the, and *zaken,* old); R. Albe's *Sepher ha-ikkarim* ("Book of Principles"), is called *Sepher Hikkarim;* the surname of one Rabbi Juda is given in this way, *Hakkadosh,* and that of another thus, *Ha-Levi,* though *ha* is the same definite article in both. German words and titles are rarely given, but not without errors. The French and Italian are well handled, still we find *Litéraire* (one *t,* p. 208), *Memoirs sur Napoleon* (without accents, p. 3), *Ercole de* (not *di* or *da*) *Ferrara* (p. 205), and similar slight mistakes. The names of the subjects, probably for typographical reasons, are all given without accents, which makes many look very awkward, as D'Estrees, Fenelon, Stael, Cambaceres, Arpad, Kolcsey, Blucher, Muller, etc. The Russian broad *v,* preceded by *o,* in the termination of family names, is represented in all possible ways, as in Ivan*of,* Volk*off,* Nakhim*ov,* and Kracheninnik*ow.* "Der*schaw*in, or Der*zh*avine," which is a mixture of German, English, and French, is another exemplification of our careless way of spelling names of nations whose alphabet is not the Roman. From the author's general rule of giving all common Christian names only in English, the Hungarian names, as attached to Katona, Kazinczy, Petoefi, and others, seem to form the only exception. The Vladislases of Hungary are erroneously mixed up with the Ladislases. King Stephen II., of the same nation, the emperor of the East, Michael II., and the Lewises of Germany receive their surnames in French, as given in the author's principal authorities for non-English biography, thus: *Le Foudre, Le Bégue, Le Jeune, L'Aveugle, L'Enfant* — while the surnames of the French Charleses are given in English, *the Bold, the Fat, the Fair, the Wise,* etc. We find, also, some inaccurate dates of reigns, as 1204 for 1205, 1826 for 1825, and 1857 for 1858, under Andrew II., Nicholas, and Frederic William IV.

Repetitions, instead of references, are frequent, being mostly intentional, and caused by differences of names or spelling, or by such additional syllables as de, di, da, del, etc., but, we must confess, in their discrepancies they often reveal an uncommon degree of haste in compiling or copying, to say the least. A few examples will suffice as illustrations:

"Cosmo II. de Medici. Grand Duke of Tuscany. Life by Aldus Manutius, Jun., 1585. Born 1519 — died Apr. 21, 1574."
"Medici, Cosmo de. The Great. 1st Grand-duke of Tuscany, Life by Baldini. Born 1519 — died Apr. 21, 1574."

"De Gerando, Joseph Mary, Baron. Fr. Statesman."
"Gerando, Joseph Mary, Baron de. Fr. Philosoph. Writer."

"D. Herbelot, Bartholomew. Orientalist."
"Herbelot, Barthol. d'. Fr. Orient. (*Biblioth. Orientale.*)"

"Fabius Maximus, Q. *Cunctator.* Opponent of Hannibal."
"Maximus, Q. Fabius. *Cunctator.* Roman General against Hannibal."

"Leonardo da Vinci. Painter. Life by Amaretti; J. W. Brown, 1828."
"Da Vinci, Leonardo. Painter. L. by J. W. Brown, 1828."

"Maccabæus, Judas. Jewish Patriot."
"Judas Maccabæus. Jewish Patriot (166–160)."

"Mathias Corvinus. King of Hungary and Bohemia."
"Matthias Corvinus. King of Hungary (1458–90)."

That of the titles attached to the eighteen thousand names many are inaccurate, will surprise nobody. Thus, Bolivar, the deliverer of half a continent, is called the "Liberator of Bolivia"; Benyowsky, who was born in Hungary, and roamed all over the world, a "Polish Adventurer"; and Solomon ben Virga, a "Spanish Rabbi" of the "16th cent.," in which there were no Jews in Spain. Such and similar errors or inaccuracies, we trust, the diligent author will eliminate by scores from his valuable work, "in revising each successive edition that may be called for." In the next, we hope to find the date of President Lincoln's birth added to that of his death, which is given.

Mr. Heilprin found full scope for the exercise of his critical powers in the reviews of such works as *Lippincott's Pronouncing Dictionary* and Haydn's *Dictionary of Dates*. He was severe in his judgments only where he considered it his duty to expose shallow pretense and deliberate carelessness; but no one could praise more warmly than he did where praise was deserved, as witness his review of Dr. J. Thomas's admirable *Dictionary of Biography and Mythology*, of which he said (*Nation*, May 19, 1870):

"Dr. Thomas's great production, to which long years of conscientious and painstaking labor have obviously been devoted, affords us the rare pleasure of bestowing almost unstinted praise on an American publication of large dimensions, and not restricted to a specialty — for universal biography, like universal history, can certainly not be classified among specialties. In fact, we must declare it the best, as well as the most comprehensive book of its description, emanating from the pen of one writer — in any language — which has come under our notice. In stating this, however, we mean also distinctly to qualify our approbation. What the comprehensive scholarship, perseverance, energy, and critical accuracy of one man may fairly be expected to do in this field, our author has amply done; but whether a task of this magnitude, to be well executed, is not above the powers of any single scholar — whatever his attainments may be — is to us a matter of grave doubt. The best universal history planned on a large scale, if written by one author, can be nothing more than an ably executed abridgment of a number of special histories; an all-comprehending cyclopædia of biography, if not done by a number of scholars, each elaborating his special branch, can at the best be an excellent compilation."

In pointing out certain minor blemishes in Dr. Thomas's work Mr. Heilprin again evinced his extraordinary familiarity with American history, and especially with the events of the Civil War, which were as fresh in his mind as when he followed them, with the keenest patriotic interest, during our military and political struggles. He said, of this part of Dr. Thomas's Dictionary:

"We unhesitatingly range ourselves on the side of the critics whom our author, as he expresses it in his preface, expected to 'admit that, on the whole, the space allotted to each notice has been apportioned with a fair measure of justice and impartiality.' And we must add that his endeavor to deal justly and impartially with his subjects, in this respect, is perhaps most evident there where a contrary inclination might most naturally be expected. Of this a comparison of articles like those on John Adams, John Quincy Adams, or Cooper, with the brief notices of Buchanan, Anna Dickinson, and similar celebrities of our day and country, will easily convince the critical examiner. The brevity of the notice of Jefferson Davis, and the judgment passed on him as leader of the Confederacy, show more than all how little the author is inclined to magnify or to criticise in accordance with newspaper talk. He seems, however, less free from a kind of patriotic Union bias in dealing with the generals of the civil war, as evinced in the notices of Banks, Butler, and others. Too great brevity in some of these notices also makes us regret a slight deviation, in the treatment of the events of that great struggle, from the 'principles of perspective' so well established for the whole work. Thus, neither the notice of Butler nor that of Beauregard has any mention of the fact of those generals facing and fighting each other on the James; the latter article has hardly an allusion to that series of events; the notice of Breckenridge contains no mention of his appearing, with Early, before Washington, in July, 1864, only the defeat of their army by Sheridan being stated. In the notice of Burnside we also discover some slight inaccuracies in date — very slight ones, it is true: 'Sept. 16,' instead of Sept. 16–17, being given as the date of the battle of Antietam; 'the 13th of December' as the day on which 'he crossed the Rappahannock and attacked Lee's army' at Fredericksburg — which is correct only as regards the attack; and 'May 9–11,' with the omission of the 12th — the hottest day — as the date of the battle of Spottsylvania Court-House. But even errors so slight as these are exceedingly rare, which is saying a great deal, if we consider that the eight hundred pages before us — the whole will likely embrace about four times as many — contain myriads of dates. Omissions of

facts and defective descriptions are much more frequent. Of this the notices of Alexander II. of Russia and of the Duchesse de Berry may serve as examples. Many heads, too, are wanting, such as, of the mythological, Dice; of the historical, Dellius; and of the literary, Büchner — names much more important than Bryczynski, Bube, or Du Buc, which we find on one page."

I must refrain from referring to other articles of this nature, but I cannot resist the temptation to quote from a review of a certain Cyclopædia of Biography a passage which shows Mr. Heilprin's telling way of pointing out absurd incongruities:

"Our cyclopædia is comprehensive enough to give the lives of such men of genius as Aromatri, Arpino, Arriazzi, Arrighetti, Arrighetto, Arrighetti, Arsilla, and Artalis, and of such monarchs as Augustulus, Charles the Simple, Dagobert, Galerius, Gratian, Juba, and Numerian. On the other hand, it is too compact and brief to mention Troy, the Iliad, or the Odyssey, in 'Homer'; the wars against the Greeks, the Scythians, and Babylon, in 'Darius'; the Peloponnesian war, in 'Thucydides'; tyranny or cruelty in 'Dionysius'; the Thirty Years' War in 'Ferdinand II.'; the wars against Napoleon in 'Frederic William III.,' or in 'Schwartzenberg'; the deposition and banishment of Gustavus IV. in the life of this king; or Brescia or Italy, in 'Haynau.' It intentionally and consistently omits all the biblical names, but with them also all the post-biblical Jewish Abrahams, Davids, Samuels, and Solomons, not excepting the greatest mediæval philosophers, poets, or scholars of that nation. Of monarchs, it gives all the Artaxerxeses, but no Xerxes; all the German Conrads, but none of the Othos, Maximilians, or Leopolds; all the English Henrys, but neither William the Conqueror nor William of Orange; all the French Charleses, but none of the Philips, not excepting Philip Augustus; a number of Spanish Alphonsos, but no Philip, not even the Second; all the Turkish Achmets, but no Mohammed (Sultan), Solyman, or Selim; no Attalus, Herod, Ptolemy, or Seleucus; no Stephen, Ladislas, Vladimir, Ivan, Waldemar, Matthias, or Pedro; nor Attila, Genseric, Theodoric, Rurik, Piast, or Arpad. It has only one Darius, one Demosthenes, and

one Pompey; no Timoleon, no Metellus, no Masaniello, no Savonarola, no Sixtus, and but one Clement; no Hunniades, no Zrinyi, no Aureng-Zebe, no Tippoo-Saib, no Chlopicki, no Niemcewicz, no Pushkin, no Petöfi. The whole letter X, though including Xavier, Xenocrates, Xenophon, and Ximenes, fills only half a page, owing, in part, to what is styled 'compactness,' and in part to the omission of Xanthippus, Xerxes, etc. Less space is devoted to Robespierre than to Rob Roy; to John Huss than to Giles Hussey; to Kant than to Kean; to Spinoza than to Spontini; to Alexander Hamilton than to Aaron Burr; to George Washington than to Benedict Arnold."

General Paez

Not many literary critics unite with the ability of marshalling minute details the gift of throwing on the canvas the outlines of a single commanding figure. How well Mr. Heilprin succeeded in historical portraiture of this kind may be seen from his sketch of the Venezuelan dictator, General Paez (published in the *Nation* of April 9, 1868). Mr. Heilprin met Paez personally, conversing with him in fluent Spanish. In the article he said:

"Few lives recorded in history, of warriors or statesmen, have been as eventful and checkered as the life of the Venezuelan warrior and statesman, José Antonio Paez. Of that eventful career, which embraces half a century of military or political activity, interrupted only by about a decade of exile, he now, for a third time an exile among us, publishes a detailed account, which is not only, as it could hardly fail to be, an interesting narrative of memorable events, but also a valuable contribution to the history of the great struggles of this continent. The introduction to the first volume of this *Autobiography,* which is now before us, and which embraces the earlier half of the author's life (1790–1829), is dated (New York) the 19th of April, 1867, the fifty-seventh anniversary of the rising of the capital of Venezuela to strike for liberty and self-rule. Paez, then an illiterate *llanero* of the plain of Apure, the overseer of a cattle-farm, became one of the earliest, most undaunted, and

most successful champions of the popular cause. Of aboriginal descent, but trained to hard service by a cruel negro slave; early inured to brave with stoic heroism the wild beasts, the scorching heat, the alternate droughts and floods of his tropical *llano;* a perfect master of the horse, the lasso, and the lance; followed with enthusiasm by men similar in birth, habits, and character, but accustomed to yield to his superior mind and will; alternately chasing and fleeing the Spaniards across the immense wilds to the west of the Orinoco — he soon became the foe most feared by the Spanish tyrants; remained constantly in the field when terror or despair had disarmed all around; joined Bolivar in the liberating campaign of 1813; fought and conquered when 'the Liberator' fled (1814); placed himself under his banners on his return (1817); saved the shattered remnants of his forces in 1818; refused to supplant him at the demand of the army; guarded the plain when Bolivar crossed the Andes (1819); was by him, on the battle-field, proclaimed the hero of Carabobo — a victory which sealed the independence of Colombia (1821); received the chief command of the department of Venezuela; besieged and reduced Puerto Cabello (1823); and, after a period of peace not undisturbed by plots and attempts of various kinds, during which he zealously exerted himself to cultivate both his mind and his state, he finally rose to the highest dignity in the gift of his countrymen, at the moment when the Colombian confederation was dissolved and Venezuela proclaimed an independent republic (1830). This consummation is to open the narrative of the second volume, which, if completing the work, must bring us the history of Paez's first and second presidential terms, ending respectively in 1835 and 1843; his first dictatorship in 1846, during the civil war of that year; his flight before Monagas (1848), and subsequent attempt to overthrow the arbitrary sway of that president; his surrender at Coro (1849), imprisonment and banishment (1850); his first return from exile on the fall of the younger Monagas, in 1858; his speedy return to the United States; his recall to Venezuela by President Tovar, who entrusted him with the chief command of the army (1861); the military insurrection in his favor, against Tovar's successor, Gual; and, finally, his second dictatorship and his death-

grapple with the revolted Federalists under Falcon, which ended, in 1863, with the victory of the latter chief, and closed, perhaps not finally, the long political career of Paez."

An Article on Poland

When America, in April, 1868, received the news of the final absorption of the Polish provinces of Russia within the body politic of the empire, Mr. Heilprin contributed to the *Nation* an editorial article entitled "Finis Poloniæ," in which he reviewed events of the past, as was his custom in writing at an important political juncture. It would be difficult to find elsewhere an equally clear and concise account of the various dismemberments of Poland, and of the conditions surrounding both the severed parts and their spoliators.

"By the first partition of Poland, executed in 1772–73 by Catharine, Frederic the Great, and Maria Theresa, or rather her son, Joseph II., Russia received some territories of the Grand-Duchy of Lithuania situated on both sides of the upper Düna and Dnieper, and now included in the governments of Vitepsk and Mohilev; Frederic annexed the bulk of Royal or West Prussia and some adjoining parts; Austria took the extensive territories now forming its province of Galicia, besides some minor ones. The second partition, in 1793, gave Catharine the Lithuanian, Volhynian, Podolian, and Ukrainian territories, now forming or embraced in the governments of Minsk, Zhitomir, Podolsk, and Kiev; Frederic William II. took Posen and other parts of Great Poland, Dantzic, and Thorn; Austria received no share. In the final dismemberment of 1795, which followed the insurrection under Kosciuszko, Catharine took the remainder of Lithuania and Volhynia (Wilna, Grodno, etc.); Francis of Austria the districts lying between the Bug, the Vistula, and the Pilica; and Prussia all the rest, with Warsaw, the capital.

For twelve years the name of Poland remained effaced from the map of Europe. A partial restoration took place in 1807, when Napoleon, having vanquished Prussia by the battles of Jena and Friedland, and compelled her to accept the humili-

ating terms of the treaty of Tilsit, transformed the larger part of her share of Poland into a Duchy of Warsaw, at the head of which he placed Frederic Augustus of Saxony. This new Polish state, enlarged in 1809 by parts of Austrian Poland, fell on the retreat of its founder from the disastrous campaign of 1812 in Russia, and was held during the deliberations of the Congress of Vienna by the armies of Czar Alexander I. By the final decision of that assembly Prussia received back a part of her share, including the present Grand-Duchy of Posen, while the bulk of the Duchy of Warsaw was annexed to Russia, as a semi-autonomous constitutional state, under the name of the Kingdom of Poland, the river boundaries of which were the Niemen, the Bug, and the Prosna. Only the town of Cracow, with its surrounding territory, was constituted a nominally independent Polish state, under a republican form of government. The arrangements of the Congress of Vienna, to which some of the powers gave their adhesion only with reluctance, thus contemplated and stipulated the continued existence of the Polish nationality, but only on the ruins of Poland.

The aim and hope of the quartered nation, however, continued to be the recovery of its national life and independence throughout the vast domain of its ancient fatherland. This natural tendency, which constantly manifested itself in agitations and demonstrations of a more or less threatening character, soon led to reactionary and repressive measures on the part of the dividing powers, in violation of promises, constitutional pledges, and treaty stipulations. The total or partial denationalization of the Polish provinces gradually became the object of the rulers, conspiracy the weapon of the oppressed. Bloody insurrections and cruel chastisements were everywhere the result. The Russian Kingdom of Poland had its grand revolutionary tragedy of 1830–31, which cost it its national army and its constitution, in spite of marvels of heroism; Galicia, its outbreak in February, 1846, immediately stifled in the blood of its nobility, victims of a terrible *jacquerie;* Cracow, its short revolutionary drama of the same month, which terminated with the annihilation of the republic and the annexation of its territory to Galicia, in open violation of the treaties of Vienna and in spite of protests from France and England; Posen, its

wild fight of 1848, under the lead of Mieroslawski, after which it remained, bleeding and exhausted, a helpless prey of the Germanizing power; Russian Poland, again, its desperate insurrection of 1863–64, which drenched its soil with blood hopelessly shed, filled Siberia with victims, and in some provinces almost entirely broke the Polish element.

The territories occupied by Russia on occasion of the first dismemberment became denationalized almost as soon as detached from their former connection, this, too, having been based on the right of conquest, and the bulk of the population being more Russian than Polish. Nearly the same was the case with the provinces annexed by Catharine in 1793. Neither was the predominant religion in these two divisions — the Greek United Church — an obstacle in the way of Russification. Descendants of Orthodox Greeks more or less violently converted by Polish masters or Jesuits, a part of the inhabitants were easily persuaded or compelled to return to the creed of their forefathers, wholesale conversions taking place chiefly during the reign of Czar Nicholas. It was also this monarch who made the first efforts for denationalizing the Lithuanian and Volhynian provinces occupied in the third partition, efforts contrary to the policy of his milder predecessor, Alexander, and stimulated by the dangers with which the widespread rising of 1830–31 threatened the integrity of the Russian empire. These efforts were successful among the mixed rural population, but less so in the towns, in which the pure Polish element prevails. But determined, as he was, to crush any new attempt at insurrection with the iron hand, Nicholas never endeavored to destroy or impair the Polish nationality in the Kingdom of Poland, created by the Congress of Vienna, though he arbitrarily abrogated its constitution. He left it its separate existence, under a viceroy, with a separate administration, separate finances, and a tariff of its own, protective even against the competition of the other provinces of the Russian empire. The language of the administration, of the courts, of the schools remained the Polish, the rights of the Catholic clergy remained almost unimpaired.

The early years of the reign of his successor, Alexander I., were characterized by still greater mildness in the government of the Kingdom. But when the stimulus given to patriotic en-

thusiasm by the inspiration of a reviving press, and still more by the events of 1859 and 1860 in Italy, followed, as they were, by liberal movements in Hungary and Galicia, brought about a series of national demonstrations in favor of a reunion of all Polish provinces under a free government; when the exertions of Marquis Wielopolski to win over his countrymen to the cause of Panslavism under the lead of the Czar not only proved a failure, but led to outbreaks of repugnance, the Russian Government soon again returned to measures of vigorous repression. The most violent of the latter, the wholesale conscription of the patriotic youths of the cities, finally led — perhaps not unintentionally — to the internecine struggle of 1863–64. Of small beginnings, this desperate strife soon assumed vast proportions, and when transient threats of interference by France, England, and even Austria added to its magnitude, the existence of Russia as the great empire of Eastern Europe seemed for a moment to be again in question. This unwonted hostile interference, the religious character which the struggle assumed in some parts, its extent and duration, the appeals of an otherwise liberal prince, of a frantic priesthood, and a no less frantic press, lately unshackled — all combined to exasperate the Russian people to a degree never experienced before. Aristocrats and freedmen, serviles and radicals, vied with each other in sacrifices for their empire, religion, and Czar; the threats of foreign powers were spurned, and the insurrection was crushed. But this time the mere crushing out of rebellion was not deemed sufficient. The Polish nationality altogether was now doomed, by the demands of the Russian people as well as by the undisguised policy of the Government, to total and final destruction. The gibbet, Siberia, confiscation, conscription, and all the means of refined despotism aided by popular fanaticism, were to do the work — and it is now being executed without mercy, without regard for treaties, for national, religious, or private rights, or for the opinion of the world.

In Lithuania and Volhynia this work — of expatriation, dispossession, and denationalization — is nearly complete. It was executed by a few bold, rapid, and deadly strokes. In the Kingdom of Poland, however, where the task is immensely vaster and the difficulties immeasurably greater, no less sweep-

ing but milder measures, more numerous and subtler means, had to be used for the achievement of the same object. Landmark after landmark was removed. The Catholic clergy were deprived of a large part of their institutions, and subjected to a rigorous surveillance; the nobility were deprived of all influence in public affairs; all higher offices were filled with Russians; the Russian language replaced the Polish in the bureaus, the courts, and the schools; the Polish press was gagged; every branch of the administration was remodelled after the Russian pattern; the government and district divisions were repeatedly altered and received new names; the internal tariff lines were abolished; the financial system was assimilated to the Russian; the separate existence of the Kingdom was made first entirely illusory, and then altogether nominal; and now, we are informed, even the shadow of its existence has been swept away, even the name has been effaced; Russia contains no Poland any more, no Polish provinces, but among her governments some hewn out of Polish ruins.

This final step Russia, we believe, would have delayed longer, from her wonted prudence and slowness, and perhaps also from regard for public opinion abroad, had not recent changes in the political complexion of Eastern Europe, consequent on the war of 1866, quickened her impulses and actions. It is true the late increase of Prussia's power has not altered the attitude of that monarchy towards Russia, and least of all, perhaps, in the Polish question; and Bismarck, with his well-known cynicism *à la* Frederic the Great, has but lately declared Poland to be a phantom living only in heated brains. It is true the national position of the Poles in Prussia has become but more difficult and more untenable for the enlargement of that kingdom and the creation of the North German Union. But the sudden, thorough, and vital metamorphosis of Austria after its late defeat; the total change of system in that empire, which has placed its new foundations chiefly on the sympathies and needs of the Hungarian and Polish elements, but late so hostile to its existence; the reorganization of Galicia on a Polish national basis, simultaneously with the restoration of the Hungarian constitution; the security of the permanence of this new system which lies in the common peril to those nationalities and Austria

in Russia's no-longer-hidden Panslavistic tendencies; the hostile attitude of Austria in the Turkish question, backed, as she is, by the sympathies of both France and England; the approaching crisis on the Danube; the danger of a general conflagration; and, finally, the reviving hopes of the Poles — these considerations urge Russia to finish her work in her Polish provinces thoroughly and speedily; and to the song, 'Poland is not yet lost,' already resounding anew on her border, she hastens to answer, 'Finis Poloniæ'! To prove the correctness of these words, she must conquer Galicia."

The Reform Movement among the Jews

Mr. Heilprin's article on "The Reform Movement among the Jews," in the *Nation* of June 18, 1868, affords a clear insight into his intellectual relations to Judaism, whose every manifestation of progressive broadening he followed with keen interest:

"Judaism, which, in spite of its original separatism, could not withstand the influence of Chaldean civilization during the Babylonish captivity, and of Hellenic philosophy in the times of the Ptolemies; which, having developed its austere talmudical shape simultaneously with the growth of Christianity, again assumed milder and more philosophical forms when the Caliphs from burners of libraries became collectors of literary treasures; which, following this new course, kept pace with Arabic culture from the Tigris to the Guadalquivir; which flourished in Provence and in the land of Dante when the vernacular Romanic tongues commenced blossoming in new literatures — Judaism had no revival in the times of the Renaissance and the Reformation. Those times, the centuries that preceded them, and the centuries that followed, belong in many respects to the darkest in the history of the Jews. Their bloody persecution during the Crusades and in the time of the black plague, their banishment from England and France in the reigns of Edward I. and Charles VI., their still more barbarous expulsion from Spain and Sicily in the year of the discovery of America, and from Portugal a few years later,

were not only destructive to their prosperity, but also to their culture, which then, in Western Europe, was approaching a regenerating crisis; while their numbers were continually increasing in the more hospitable and tolerant, but still less civilized, Polish and Turkish provinces. Their condition grew still worse when both Poland and Turkey commenced decaying, and Germany became the bloody theatre of desolating wars between Catholicism and Protestantism. The Christian sects seemed to vie with each other in oppressing them. And the complicated system of petty tyranny — of extortion, exclusion, and humiliation — under which the Jews now groaned for centuries was more destructive to their intellectual development than had been their more sanguinary, but less constant and systematic, persecutions in the Middle Ages.

Even about the middle of the last century the Jews lived as strangers, and were treated as enemies, in almost all the European countries the air of which they were allowed to breathe. The land of their birth was to them a land of captivity or exile (*galuth*), as Babylonia had been in ancient times. Its language was to them the language of unholy oppressors, unworthy to be used as a medium for sacred rites and literature. The vernacular which they used in profane things or in translating Hebrew texts was a jargon, mostly German, mixed up with Semitic and other foreign words and forms. Spurned and hooted at for their wretchedness, and slandered as enemies of Christ and his followers, they, in their turn, despised the Christians as cruel and profligate idol-worshippers, and withdrew from their communion as contaminating. Modern literature was approached by them only with fear and suspicion. The sciences, which, with the exception of medicine, offered no reward, neither distinction nor position, to their Jewish votaries, were regarded as humble *ancillæ* of the holy science of the law (*torah*). The latter study, in all its scriptural, talmudical, and rabbinical vastness, was cultivated, with unparalleled zeal and perseverance, as the only source of true mental culture, spiritual felicity, and worldly honors. The study of the law and the observance of its numberless rites and obligations consumed a considerable portion of every educated or half-educated Jew's life. The wretchedness and bitterness of that life were borne

with resignation as well-deserved chastisements for sins and transgressions, and softened by the recollections of a marvellous national past and the expectation of a Messianic future. There were exceptions of every kind, but they were rare.

Those exceptions, however, became more and more numerous with the general progress of enlightenment and of the spirit of toleration in the age of Voltaire and Rousseau, Hume and Gibbon, Frederic the Great and Joseph II., Lessing and Mendelssohn. But it is the latter period of the last-named philosopher's life with which the modern era in the intellectual and religious history of the Jews begins. What Luther was to Christian Germany and Europe in the sixteenth century, Mendelssohn became to his co-religionists in the eighteenth. What Luther's translation of the Bible worked among Christians, Mendelssohn's German Pentateuch, in Hebrew letters, with commentaries and an introduction, achieved among the Jews. Not that the Jewish philosopher advocated or intended a reform of the synagogue. Both his modesty and his principles opposed such an enterprise. The immense influence he exercised upon his people was due to his eminence as a writer and thinker, which attracted the admiration of all and the emulation of many; to the Socratic charms of his conversation, which made his circle in Berlin a focus of enlightenment; to his liberal views on church and state and on freedom of thought, as enunciated in his 'Jerusalem'; to his theory, expounded in the same work and so welcome in an age of rationalism, that Judaism, which was a national religion, inculcated only practices leading to ideas, but promulgated no dogmas; to the revival among his co-religionists, through his Hebrew writings and German translations, of the taste for Biblical criticism, for exact and pure diction, for the beautiful and æsthetic in connection with the sacred, which had adorned the golden age of their forefathers in Spain and Provence; to the powerful co-operation, in this literary revival, of his Jewish friends or disciples, the great Hebraists Wessely, Euchel, and others, in whom the kindled imagination of the younger Hebrew students saw new Hallevis and Kimhis side by side with a new Maimonides; to the no less powerful co-operation of his numerous Christian co-laborers on the field of German literature, and especially of Lessing,

in dispelling anti-Jewish prejudices, and thus making it possible to the Jews to issue from their isolation and occupy a place among the enlightened of other nations; and, finally, to the Jewish and moral purity of his life, which taught the Jews that, even after Spinoza, Judaism and philosophy were not irreconcilable, and the Christians, that a faithful disciple of the rabbis could serve as a model for a 'Nathan the Wise.' It is true bigotry and prejudice on both sides but slowly yielded the ground; some rabbis fulminated against him whom others revered as the third Moses — the lawgiver being the first, and Maimonides the second — and even the Voltairean Frederic crossed out his name on a list of proposed members of the Berlin Academy; but when that monarch and his *Schutzjude* died — both in 1786 — freedom of thought and free thought had made immense strides. The 'inalienable rights of man' had been proclaimed in the New World; they were going to be promulgated, in a more terrific revelation, to the Old.

The Abbé Grégoire carried the equality of the Jews in the French Constituent Assembly. The armies of France carried it into the Austrian Netherlands, into Holland — long a refuge to persecuted Jews — and across the Rhine and the Alps. Even where equality was not granted, the condition of the Jews was gradually ameliorated. They ceased to be considered as strangers, and, what was more important, they gradually ceased to consider themselves as such. A desire for political and social disenthralment added fuel to the already kindled desire for mental self-regeneration. This double movement among the Jews, which from the fatherland of Mendelssohn radiated into the adjoining countries, was not only effective in ripening a vast number of individual talents and capacities, soon to be distinguished in various fields of literature, science, and art, but also productive of public reforms in congregational life, schools, and synagogues. Wessely and his friends, the learned and brilliant writers of the *Measseph* ('Gatherer'), gave a powerful impulse to educational reform, and met with the hearty co-operation of Friedländer, Herz, and Jacobson, Jews distinguished by wealth, refinement, and social position, who carried the agitation also into other fields.

The question of religious reform was the highest, the gravest,

and the hardest of solution. The want of it began to be seriously felt, but on what principle, in what spirit, and how far it was to be carried, were questions in answering which opinions differed widely. The bulk of the Jews at that time — as is still now the case in Poland — consisted of strict believers, to whom the least and last rabbinical injunction was equally divine with the Decalogue, and whose faith in a future Messianic restoration was no less firm than their belief in monotheism; others were more or less strict conformists from habit, from love for the more essential parts of Judaism, or from repugnance to the trinitarian and similar dogmas of Christianity; still others, whose number was daily increasing, were only nominal Jews, having given up all religious practice from conviction, indifferentism, or light-mindedness; and finally, not a few, yielding to outer pressure, and despairing of the future of their people, were daily abandoning the faith of Israel to seek repose or emoluments in the shade of the cross. Mendelssohn seemed to have expected a remedy for this condition of affairs only from the influence of enlightenment upon the individual Jews, each of whom was to save, first, his freedom of thought, and then his conscience as well as he could. Wessely, an enlightened but zealous rabbinist, demanded the purification of Judaism on the strictest orthodox principles, chiefly by means of education. Others, like Jacobson, a man of the younger generation and of the world, agitated for a thorough-going reform of the ritual. The Kantian philosopher, Bendavid, proposed the total abandonment of all ceremonial parts of Judaism, which, under entirely altered circumstances, he argued, had lost their efficiency for good, and were only a dead weight on pure Mosaic monotheism. And, driven on by a still more violent current of rationalistic opinion, Friedländer even went so far as to ask in an 'Epistle' to a distinguished Christian theologian, Teller, for reasonable terms under which conscientious liberal Jews could join the Church. Most of these early attempts, however, meeting with no encouragement on the part of the Jewish people as well as of the governments, hardly led to any immediate result. The time, too — that of the Napoleonic wars — was decidedly adverse to movements of this kind, though by its crushing power it worked wonders in transforming the formerly

so-despised Jews of Central Europe into active, energetic, and often leading members of modern society. When peace returned, and literature and science, art and commerce, revived, single Jews soon became conspicuous everywhere, some, it is true, only Jews by name, like the composers, Moscheles, Meyerbeer, and Halévy, and others even nominal Christians, like Heine, Börne, and Gans. Jewish congregational life, too, assumed a new aspect. Sermons in pure living idioms, vocal music of a modern style, and here and there an organ, were heard in the synagogues; catechisms and other manuals elaborated on modern principles were introduced in the schools. A kind of general reform had taken place in France, consisting mainly of a declaration of radical Jewish principles by a so-called French Sanhedrim, in accordance with the wishes of Napoleon, but also involving a systematic congregational organization with a leading central consistory for the whole of France.

Jewish literature, in the stricter sense of the term, now took a fresh start. Of the vast number of writers, chiefly in German and Hebrew, who flourished during the first two decades after the Napoleonic era, we can mention here only a few of the most conspicuous: Jost, the author of various comprehensive histories of the Jews and of Judaism; the Galician, Rapoport, whose biographico-critical masterpieces, contributed to the *Bikkurey Haittim* ('First-Fruits of the Times'), may be said to have created a new literature; Zunz, who in his 'Gottesdienstliche Vorträge der Juden' showed himself a worthy disciple, if not a rival, of Rapoport; Reggio, the author of 'Hattorah veha-Philosophia' ('The Law and Philosophy'), and of some more valuable minor works; and S. D. Luzzatto, of the Padua Rabbinical College, chiefly renowned as Biblical critic and Aramaic scholar. These were closely followed by a new generation of *literati*, to the most eminent of whom belong Geiger, Sachs, Frankel, Philippson, Fürst, Munk, Franck, and Grätz, all Germans by birth. Independent criticism searched and ransacked every corner and remnant of the Jewish past. Numerous important periodicals were started. The *Kerem Hemed* ('Lovely Vineyard') took the place of the *Bikkurey Haittim*, to be succeeded in its turn by the more radical *Halutz* ('Vanguard'), published chiefly by Galician writers, and by the

Carmel, an organ of the Russian Jews; Riesser published his *Jude;* Geiger, his *Zeitschrift für jüdische Theologie,* and similar periodicals; Philippson, his *Allgemeine Zeitung des Judenthums;* Fürst, his *Orient;* Cahen, the *Archives israélites de France;* Frankel, his *Monatschrift* — not to mention a multitude of other, mostly short-lived, journals in Hebrew and various living tongues.

While this progress in literature was going on, partly promoting and partly following the progress of Jewish political emancipation, the cause of religious reform, too, was advanced, first feebly, but afterwards more powerfully by Geiger, who in 1835 took the lead in a movement for the regeneration of rabbinical Judaism through a rational and liberal development of its own spirit. In this he was aided by Philippson, by powerful synagogue orators like Salomon and Mannheimer, and by numerous rabbis, of whom Holdheim soon outstripped his master. This movement culminated in the three rabbinical synods of Braunschweig, Frankfort, and Breslau in 1844, 1845, and 1846, which adopted, among others, resolutions confirming those of the Napoleonic Sanhedrim, and advocating considerable changes in the liturgy, in sacramental and marriage rites, and in the observance of the holidays, all tending to harmonize the religious life of the Jew with his civil life and with the ideas of the age. This agitation met with a storm of opposition from various quarters. Some assailed it as heretical, and in spirit or tendency subversive of all Judaism; others, as a slow, timid, and double-faced movement, which, while pretending to be both rabbinical and rational, was neither the one nor the other. Hirsch and other orthodox scholars attacked it with the weapons both of erudition and sarcasm, while reform associations in Frankfort, Berlin, and elsewhere just as loudly declared their disapproval on opposite grounds, and, under the lead of men like Creizenach, Holdheim, Bernstein, and Stern, openly renounced all allegiance to the Talmud, repudiated all hope of Jewish national restoration, rejected almost all the ceremonies as dead, and generally made the Sunday, instead of the Saturday, their day of worship. Revelation, if not ignored as purely dogmatical, was by most reformers accepted only in a rationalistic sense. Behind Geiger and his associates, though still in-

clined towards reform, remained Frankel, while other enlightened theologians, like Rapoport, seemed still to occupy the standpoint of Mendelssohn, and cautiously avoided the arena. Generally, however, the discussions were animated and often violent, leading to dissensions and splits in the congregations, and not rarely, also, to interference by the government. The great political events of 1848–1850 for a time quieted the animosities and considerably diminished the interest in these struggles, but they have since been resumed, though with abated vigor. The questions, the tendencies, the differences of opinion are still the same; a harmonious solution is still far remote.

Germany has remained to this day the central theatre of the movement, which is felt, with more or less force, from Odessa to San Francisco, and from Stockholm to Algiers. In France discussions on reform, representing all shades of opinion, have been participated in, among others, by Terquem, Cahen, Cerfbeer, Crémieux, Munk, Franck, and Rodrigues, but with little effect, owing to the religious indifference or ignorance of the mass of French Jews. In all other countries, England and the United States not excepted, the religious as well as literary movements of the Jews are but reflections of those going on in Germany."

Charles the Bold

In a noteworthy review of John Foster Kirk's *History of Charles the Bold, Duke of Burgundy* (*Nation*, June 25, 1868), we find a remark concerning American historians to which Mr. Heilprin, in conversation, occasionally returned:

"American historiography," he said, "like American history, has its starting point in the discovery of this continent. Its first productions — be the cause rational choice, predilection, or accident — cluster around that natural base as if around a fountain-head, from which its streams are to flow through radiating channels in various directions. Irving takes us to Andalusia to witness the great departure from Palos, and after carrying us across the sea with his hero, 'Christopher Columbus,' and across the new continent with the 'Companions of

Columbus,' he returns to the Hispano-Moorish province, studies and sketches the 'Conquest of Granada,' the Moslem stronghold, and in after life reaches both ends of his double course in his 'History of Mahomet and his Successors' and in his 'Life of Washington.' The downward western course is more amply developed by Sparks, Bancroft, and Palfrey, but Prescott takes us back to Spain and the times of 'Ferdinand and Isabella,' to descend to those of their grandson, Charles V., in his 'Conquest of Mexico' and 'Conquest of Peru,' and finally to those of their great-grandson, 'Philip the Second.' Motley takes up this line, going over from Charles V. and Philip of Spain to their revolted subjects in the Low Countries, and in his 'Rise of the Dutch Republic' and the 'History of the United Netherlands,' describes the grandest and purest struggles of Protestantism, the further grapplings of which with the power of the house of Austria he intends to sketch — if the report be true — in a history of the Thirty Years' War. Kirk, another and more intentional continuator of Prescott, goes a step further backward, ascending to an earlier period of the history of the Netherlands, which the daughter of his hero, 'Charles the Bold,' Mary of Burgundy — the grandmother of Charles V. — was to bring over, as her dowry, to the house of Austria."

Napoleon I.

We have an interesting glimpse of Mr. Heilprin's estimate of Napoleon I. in his article on "Bonaparte in Italy"[1] (*Nation*, December 10, 1868).

"The Imperial author of the *Vie de César* has published no work on the life of the modern Cæsar, his uncle. But no elaboration of his on that subject could be as meritorious as the grand collection of Napoleon's correspondence — political, military, and administrative — now appearing under the auspices of an Imperial commission, and of which twenty-five volumes have been published, containing about twenty thousand pieces — letters, reports, proclamations, notes, etc. The archives not

[1] "Ausgewählte Correspondenz Napoleons I. Aus dem Französischen übersetzt von Heinrich Kurz." Vol. I. Hildburghausen. 1868.

only of France, but also of Germany, Russia, Sweden, Italy, and other countries, and numberless private collections, have been ransacked for the benefit of that extraordinary publication, from which, however, all private letters of the founder of the French Empire — and probably also a number of other papers — have been excluded. On the other hand, all papers communicated are given entire, without omission or alteration. The value of such a collection for the historian is obvious. The general reader of history, however, must naturally find it too vast, and both on account of its details, especially in military matters, and of its numberless repetitions, not a little tedious. To bring its contents, free of these defects, within the reach of the general reader, Heinrich Kurz has begun the elaboration of an abridgment, based on critical selection, of which the first volume is now before us, embracing, besides some introductory and some supplementary letters, four hundred pages relating to the history of the Italian campaigns of 1796 and 1797, the most brilliant period, perhaps, in the eventful career of the great conqueror.

It is almost needless to state that four hundred selected letters and public writings of Napoleon, illustrative of such a period, form an intensely interesting and highly instructive volume. Most of them are addressed to the Directory; some, confidentially, to Carnot; some to French generals and diplomats; some to the princes of Italy, the Pope, and the Emperor Francis; some to men of science and art; others, in the form of proclamations, to the army. The youthful warrior and diplomat, the future emperor and conqueror of Europe, is almost completely depicted in them. We see him working, organizing, marching, and conquering; we watch him planning, scheming, and brooding; we hear him advising, commanding, menacing, negotiating, and cheating. We admire his military genius, his courage and energy; the keenness of his intellect, the maturity of his ideas, and the wonderful vigor of his words; his consummate diplomatic skill, which seems almost marvellous in a man of twenty-seven; his prudence and patience, of which a long run of good luck and the unrestrained habit of commanding divested him in after-life. We are astounded by his success; we are shocked by his heartlessness. From the foot of

the Alps, where he assumes command over a ragged, famished, and demoralized army, we follow him to Montenotte, Millesimo, Dego, Ceva, Mondovi, and Lodi; to Milan, which he liberates; to Lonato, Castiglione, and Bassano; to Arcola and Rivoli; to Mantua, which he forces to surrender; through Modena, Bologna, and the Romagna, to Tolentino, where Pius VI. is compelled to purchase peace; across the Alps, through Görz and Klagenfurt, to Leoben, where the Emperor, trembling for Vienna, finally agrees to preliminaries of peace with the French Republic; back to Milan, where he lords it over Italy; and finally to Campo Formio, where the definitive treaty of peace is concluded which terminates this period, a treaty by which Francis treacherously sacrifices parts of Germany, and Napoleon Venice. And all this belongs to the history of one year and a few days of victory.

Even before starting on his march into Germany Napoleon could thus address his soldiers:

"You have conquered in fourteen pitched battles and in seventy engagements; you have captured more than one hundred thousand prisoners, five hundred field-guns, two thousand heavy cannon, and four pontoon trains.

"The contributions imposed upon the countries conquered by you have fed and paid the army during the whole campaign. Besides this, you have sent the minister of finance thirty millions for the relief of the public treasury.

"You have enriched the Paris Museum by upward of three hundred works of art, masterpieces of ancient and modern Italy, to produce which thirty centuries were needed.

"You have conquered for the Republic the finest regions of Europe; the Lombard and Cispadane Republics owe you their freedom; the French banners for the first time wave over the shores of the Adriatic, in face of old Macedon, to which you can sail in twenty-four hours; the Kings of Sardinia and Naples, the Pope, the Duke of Parma, have abandoned the coalition of our foes and sued for our friendship; you have driven the English from Leghorn, from Genoa, and from Corsica."

These words, which tell what were the *res gestæ*, also tell us how the *nervus rerum gerendarum* was obtained. War was made to support war by a system of merciless extortion which differed

from the plunderings of ancient and mediæval invaders perhaps only in the manner of its execution. Poor Italy, whom Bonaparte pretended to free, while he was ready to barter away her lands and people; whose past he glorified in his proclamations while, in his reports, he spoke of her living sons in words of intense and boundless contempt — Italy was made to bleed from every pore. Contributions, paid, being paid, or to be paid, are a constant theme of our young conqueror's lucubrations. He eagerly grasps every opportunity of extorting money. He is inventive in creating opportunities. He plans pretexts. But he does it all in a very polite way; he bleeds with polished instruments. He certainly is no Vandal conqueror; he destroys no works of art; he only carries off the best ones. He evinces a taste not only for statues and pictures, but also for manuscripts and anatomical collections, of which he sends off a part. He burns no temples; he only empties some of their treasures. He respects the superstitions of the conquered, and sends the Madonna of Loreto unmutilated, and with all her precious ornaments, to Paris. He sends her privately to the Directory, some of the members of which may have particular regard for piously decorated Madonnas, while the attention of others — or of the same — is directed to the merits of 'a hundred carriage horses, the finest that could be discovered in Lombardy.' Besides all this, which is done decently and systematically, by order of Napoleon, an immense deal of extortion is done by a swarm of authorized and unauthorized commissioners and agents of the Directory, who infest every corner of Northern Italy, and whose robberies, peculations, and shamelessness the general hardly finds words to stigmatize. The soldiers, too, in spite of most rigorous regulations and frequent shootings, manage to plunder and rob on their own account. At an early stage of the campaign these liberators are designated by their leader himself 'an army of brigands.'

While contributions feed the army and gorge the Directory and Paris with plunder, a military reign of terror keeps Italy with all its hostile elements — princes, priests, nobles, and a monk-ridden peasantry — in awe and subjection. What that terrorism is, a few quotations may show. An outbreak having taken place in some villages of the Milanese, and an order to

lay down arms having been disobeyed, a proclamation announces that 'the generals will march the necessary forces to subject them, burn them, and have every man found in arms shot. All priests and all nobles who remain in the rebellious communities will be arrested as hostages and sent to France.' The fate of Binasco and Pavia soon after proves that such are not empty threats. Some Frenchmen having been killed at Bosco, General Berthier is directed to throw the council of the place into prison, and to declare that if they refuse to name the guilty, 'and do not, on the spot, make out a list of at least twelve persons,' they will be immediately shot. The people of the vicinity of Tortono are guilty of a similar crime, and Napoleon reports: 'I have had fifteen of the ringleaders arrested, tried by a military commission, and shot' — the names having been obtained in the way indicated to Berthier. On entering the Papal dominion, Napoleon proclaims: 'Art. 1. Every village or town in which alarm-bells are sounded at the approach of the French army is immediately to be burnt down, and the council thereof to be shot. Art. 2. Every community in whose territory a Frenchman shall be murdered shall be placed under martial law; a mobile column shall be sent there, hostages taken, and an extraordinary contribution levied. . . .' And yet all this is mild and humane when compared with the orders issued on the eve of a march into the Tyrol, orders, however, which we believe to have received no practical application.

And yet Bonaparte was neither greedy nor cruel. Nor was he by nature hypocritical or false, though his Macchiavellism appears no less great than his heartlessness, when required as a means. 'All the fortified places of the Venetian Republic on the Adige,' he writes to the Directory as early as July, 1796, 'are now in my hands. You may find it suitable to begin, even now, a slight quarrel with the Venetian minister at Paris, so that, after the capture of Mantua and the driving of the Austrians from the Brenta, I may find a greater willingness to listen to the demand for a few millions which you intend me to make.' 'Is it your desire,' he writes on another occasion, 'to revolutionize Piedmont and to annex it to the Cispadane Republic? The means to do this without war, without violating either treaty or propriety, is to blend a corps of ten thousand

Piedmontese, who must needs be the kernel of the nation, with our army, and to make them partake in our victories. After six months the King of Piedmont shall be dethroned. It is the spectacle of a giant embracing a dwarf and pressing him to his bosom; he suffocates him, but he cannot be accused of a crime. The result is owing to the extraordinary difference in their organizations.' He flatters both the Pope and the Emperor, though he heartily hates the one with all his empire, and heartily despises the other, 'the old fox,' with all his clergy. He speaks 'of the religion of our fathers' to Cardinal Mattei, and assures the French minister of foreign affairs that he could easily manage Egypt with armies like his, to whom 'all religions, Mohammedans, Copts, Arabs, idolaters, etc., are alike.' Hating anarchy and Jacobinism no less, or even more, than *émigrés* and royalist conspirators, he yet hesitates not to stir up revolutionary passions against clerical influences, to inspire the Italians with 'fanaticism against fanaticism.' He vaunts the conservatism of the army, and incites Barras to commit a *coup d'état*. Of course, all this is done in the interest of the French Republic, of 'the greatest of nations,' and of the Constitution of the year III., and, if we believe his repeated assertions, from the purest of motives and without personal ambition, as he longs to retire into private life, preferring peace to glory, and looking for reward in his 'conscience and the opinion of posterity.'

But although no glimmer of conscience or moral feeling, in the stricter meaning of the word, is to be found in all these hundreds of letters, a strong sense of the noble, the decorous, and even the virtuous, is almost everywhere perceptible, no less than an intense contempt for everything sordid, and meanly selfish. He admires patriotism no less than heroism. He speaks of the self-sacrifice of a poor washerwoman with the same warmth of feeling with which he claims acknowledgment for the brilliant services of Berthier, Augereau, Joubert, Victor, Lannes, Marmont, or Junot. He writes to every member of the government, separately, to procure relief for the widow of one of his heroes. Terrible to the enemies of France, he is yet free from personal vindictiveness. He neither belittles the deeds of possible rivals — though he betrays his dislike for Moreau — nor speaks boastingly of his own achievements. He honors

the devotion of his military antagonists, and never ridicules them when fallen. Though born to command, his tone is unassuming, respectful to superiors, and almost austerely modest. He is dignified even when flattering, and not entirely untruthful when deceiving. Men of science or literary genius he treats with great distinction. Altogether, we find it natural that many who knew him at that time, finding in him the talents without the vices of Cæsar, were inclined to exclaim, 'Hic erit Scipio!'

And yet his ambition even then was soaring over all Europe and beyond it. He was planning the conquest of Egypt, of Malta, and of England. He offered his mediation to the Swiss Cantons, received Hellenic deputations, formed Polish legions, and exerted himself to gain the favor of 'the brave Hungarian nation.' Beyond conquered Corfu, he follows in his thought the shining track of the Macedonian; he will penetrate to the Nile, like Alexander; he will cross the Alps, like Hannibal — he will cross the Rubicon, like Cæsar."

Between 1868 and 1870 Mr. Heilprin wrote a number of historical and critical articles for the *Nation,* the most important among which were a review of Renan's *St. Paul* and two papers on Panslavism. These articles embodied the results of profound studies, and their value has remained unimpaired by the lapse of time. The march of events since the essay on "Panslavism" was published (*Nation,* May 14 and 28, 1868) has strikingly verified some of the forecasts made therein. It is only necessary to refer to the growing importance of the Polish question and to the renewed interest in Panslavism evoked by the recent annexation of Bosnia and Herzegovina on the part of Austria. Both the articles on Panslavism and that on Renan's *St. Paul* are here reproduced.

Panslavism

I

Three families of nations, all belonging to the Indo European grand-division of mankind, the Slavic, the Teutonic, and the Romanic, can be said to rule the globe in our times.

They may be designated as the eastern, the north-western, and south-western branches of that grand stem, into which countless centuries of growth have ramified it, and around which cluster numerous minor offshoots of the same, as well as some detached from different trunks. All the north of Asia, from Behring's Straits and the mouth of the Amoor to the Ural, and almost all Europe east of the Baltic and the Adriatic, and of a winding line connecting these two seas, belong to the Slavic race, which has absorbed or entirely overpowered the Finns, Lithuanians, Crimean Tartars, Circassians, Bashkirs, and numerous other tribes, and closely encircles the Magyars, Roumans, Albanians, and others. The rest of Europe and almost the whole of America, unequally divided into northern and southern halves, Australia, parts of Africa and Southern Asia, and almost all the islands of the seas, are held by the Teutonic and Romanic nations, who have absorbed, exterminated, or subjected, among others, the Basques, the Celts, the aborigines of this continent, the Hindoos, and the Malays. Their flags float triumphantly over all the oceans. The Sultans of Turkey and Morocco, the formerly impenetrable empires of Cathay and Japan, yield to their dictates; the Arab and the Egyptian construct their canals; the Kabyl and the Abyssinian vainly oppose their arms.

Of these three dominant families of nations, the Teutonic is throughout in a flourishing condition. It embraces the most enlightened and progressive, the most industrious and active, the freest and richest nations of the earth. Each of its members is independent and sovereign in the land it inhabits. All enjoy self-rule and constitutional freedom, though under manifold forms: republican democracy in the United States and Switzerland; democracy combined with monarchy in Norway and Denmark; liberal aristocracy in England; and mixed constitutionalism in Holland, Sweden, and Germany. Although some of these nations, like Holland and Sweden, have already played more conspicuous parts in history than they do now, none is in a condition of internal decay; only their external relations are changed. Almost all are advancing with the hope of a still brighter future. Their religion, with few exceptions, is the Protestant.

The Romanic family consists mainly of nations that have passed the zenith of their glory. Some of them show evident marks of decay, if not of incurable rottenness. Such are Spain and Portugal, which, after centuries of world-wide fame and power, have nearly succumbed to the internal infection of bigotry, pride, and luxury, combining to produce an unparalleled system of royal and clerical despotism. Their former colonies, now independent states, founded on a substratum of an inferior race, seem to be decrepit in their very infancy. Italy and Roumania struggle hard, and not without foreign aid, for regeneration after ages of degeneracy. France alone, the leading Romanic state, stands erect and powerful in the foremost rank of civilized nations, though, as many believe, on the very verge of decadence, the forecast shadow of which is already traceable in the character and spirit of her people. Most of the members of this family are convulsed by frequent revolutions, which seem only to displace tyranny, and but rarely inaugurate a normal rule of freedom. Their movements are unsteady, their aims indefinite and vague, their culture superficial. Progress and reaction alternate, each running into excess. Every nation, however, is independent, except the Roumanian, which is autonomous but tributary. The Catholic religion prevails in all, with the same exception.

More peculiar still is the general aspect of the Slavic family. It consists not of nations uniformly free and advancing, nor of nations decayed, decaying, or in the throes of regeneration, but of one great overshadowing empire, and of a large number of minor peoples and tribes whose political life has been cut short by external violence before internal decay set in. That empire is Russia, which contains the only independent Slavic nation. The western and southern Slavi, who, during the great migration of nations, had spread as far as the lower Elbe, the headwaters of the Danube and the Drave, and beyond the Balkan, the Isthmus of Corinth, and even the Hellespont, early in the Middle Ages founded independent kingdoms and principalities near the shores of the Baltic, the Adriatic, and the Euxine, on the Vistula, the Elbe, and the Danube, and on both sides of the Carpathians; but, disunited among themselves, often fighting one another, and feebly organized, they gradually receded

before mightier neighbors, and finally succumbed to the superior culture and discipline of the Germans, or to the impetuous valor of the Hungarians and Turks, Poland alone falling under the strokes, chiefly, of a Slavic people, the Russian. The too far advanced Slavic populations almost entirely disappeared; those established between the Oder, the Elbe, and the Saale, with the exception of the Wends in Lusatia, were Germanized after long struggles; those on the upper Save, Drave, and Mur shared nearly the same fate; the Great-Moravian empire, founded by Svatopluk, east and west of the Carpathians, fell, about the year 900, under the sword of the Magyars, who had then for the first time entered and occupied Hungary; Croatia was annexed to the latter country about the beginning, and Slavonia about the middle, of the twelfth century; Serbia was conquered on the battle-field of Kosovo, in 1389, by Sultan Amurath I.; Bulgaria was subdued soon after by his son Bajazet, and Bosnia, after various vicissitudes, by Solyman the Magnificent, in 1528; Bohemia, the oldest Slavic kingdom, virtually lost its independence on the death of King Louis in the battle of Mohács (1526), fought against the last-named Sultan, when for a second time it reverted to the house of Austria, and it lost its freedom when, after the battle of the White Mountain (1620), the Emperor Ferdinand II. tore its charter of liberty, as forfeited; last of all, Poland, having flourished for eight hundred years as an independent and mighty kingdom, was divided by three neighboring powers, Russia, Austria, and Prussia, toward the close of the last century, and all its subsequent attempts to recover its independence have proved futile and self-destructive.

When Poland fell, all national pulsation seemed long to have ceased among all other Slavic populations of the west and south. The Bulgarians, Servians, Bosnians, and Montenegrins — the latter with some intervals — had so long groaned under the Turkish yoke; the Croats and Slavonians, the Slovacks in north-western, the Ruthenians in north-eastern, and the Rascians in southern, Hungary, had so long been ruled, led, or oppressed by the Magyars; Dalmatia had become so much Italianized by Venetian influences; the nobility and urban populations of Bohemia, Moravia, Silesia, Styria, and Illyria so much Ger-

manized under the house of Austria, that the remembrance of the free national past seemed to live among the Slavi of all these countries only like "an ancient lay." Any lingering hope of resurrection appeared to most observers an idle dream. But when Polish liberty succumbed, French liberty became triumphant over all its enemies, and commenced convulsing Europe with the ideas of popular rights, independence, and national regeneration. Shock followed shock. From the Seine and the Tagus to the Pruth and the Niemen the existing order of things was shaken to its foundations. The people everywhere became conscious of their rights and power. The new gigantic structures raised by victorious France, in their turn, crumbled under the pressure of popular enthusiasm. The people fought against Napoleon in Spain and in Tyrol; the people were appealed to against him by Czar Alexander and by Frederic William in 1812 and 1813. On the fall of the great conqueror, the people almost everywhere demanded their rights. Spain, Naples, and Piedmont rose to strike for liberty in 1820, though in vain. A Greek *hetairia* raised the standard of Hellenic freedom in Moldo-Wallachia; the Peloponnesus and the islands followed, and Hellas revived. Poles and Russians conspired, separately and jointly, for the overthrow of despotism. Another regenerating movement, though of a different character, begun simultaneously with the fall of Poland, took place in Hungary. Roused from a long slumber by the centralizing and Germanizing attempts of Joseph II. (1780–1790), the Magyars not only reasserted their national autonomy on the accession of his brother and successor, Leopold II., but also began with equal enthusiasm, ability, and success to revive, cultivate, and spread their own Turanian tongue, and to revindicate for it the place which the Latin had occupied as a parliamentary, scientific, and international medium in their assemblies and public institutions. All these movements could not but react upon the Slavic race, and rekindle the latent sparks of national consciousness even in the most oppressed and most neglected of its members.

Where religion aided to set those sparks ablaze, the first movements immediately assumed the shape of insurrectionary outbreaks. The Servians and Montenegrins, aided or instigated by Russia, were the first to strike for independence — the former

under the lead of Czerny George and then of Milosh Obrenovitch, the latter under their Vladika, Peter Petrovitch I. — and, fighting long and bravely, conquered a partial national autonomy even before the outbreak in Greece — an autonomy which Servia, under the sons of those two kneses, has not only succeeded in defending, but also in considerably enlarging. Next followed a general literary movement, aiming at a revival of all the Slavic tongues and the development of Slavic literature throughout the Austrian empire and on its Turkish borders. Of this movement Pesth, Agram, Vienna, Prague, and Moscow became the centres. Journals, schools, libraries, and archives were founded. Eminent writers, like the Serb Karajitch, the Slovacks Kollar and Schafarik, the Moravian Palacky, subsequently historiographer of Bohemia, and the Croat Gaj, writing in various Slavic dialects and in German, not only roused the spirit of their compatriots to a consciousness of their own genius and the knowledge of their past, but also attracted the attention of Europe.

But the respective spheres of these and similar writers were too narrow, the population speaking their dialects too poor and too ignorant, to support so many literatures and institutions. This circumstance was, perhaps, what mainly suggested to Kollar the idea of a union, for literary purposes at first, of all the Slavi. In a German work on "Literary Reciprocity between all the Tribes and Dialects of the Slavic Nation" (Pesth, 1831), he endeavored to prove to the Slavi of all countries that their various idioms, of which the Russian, the Polish, the Bohemian (or Czechic), and the Servian are the principal, differed no more from each other than did the Attic, the Ionian, the Æolian, and the Dorian dialects of the ancient Hellenic, the differences of which did not prevent the Greeks from developing one grand literature or from essentially forming one grand nation. The same path of glory, he argued with fervor and eloquence, was open to the Slavi. The institutions, the literary products, the idioms, the thoughts, the genius of all the Slavi had only to become the common property of all, and they would excel the rest of the modern world as the Hellenes excelled all other nations of antiquity. This dazzling idea was received with acclamation by all the Slavi, except the

Poles, who, having risen in insurrection against Russia in 1830, were just bleeding away under the sword of the only independent Slavic people. But when the struggle was over, some of their exiles, and among them their great poet, Mickiewicz, joined in the general chorus. Literary union and linguistic fusion became watchwords, and were carried into effect to a certain degree, chiefly among the Slavi on the Save and lower Danube and on both sides of the western Carpathians. Alphabets being assimilated, slight grammatical distinctions dropped, and words exchanged, the dialects of Servia, Croatia, Slavonia, and Dalmatia were nearly melted into one Illyrian language, and the Czechic became the common tongue of the Bohemians, Moravians, and Slovacks.

II

The idea of Kollar, thus put into practice, was the first germ of Panslavism. From a literary union of all the Slavi there was, in thought, only one step to a political union. This slight *salto* was soon made by the Slavic agitators, who were secretly, and for obvious reasons, aided by Russian agents and subsidies, and here and there also by Austrian agencies, desirous to counteract the growing power of the Hungarian nationality. It was easy to prove from history that it was weakness arising from disunion among the Slavi which had subjected them and kept them subject to the sway of the Germans, the Hungarians, and the Turks; that it was through union alone that they could revindicate the prominent position due them by right of numbers and by right of history among the great races of the European world. Germany and Italy, too, after similar experiences, were striving for union. But as in Germany and Italy two opposite courses were pursued, by various political factions, toward the same aim — an agitation for democratic union through revolution, and an agitation for monarchical union through the houses of Hohenzollern and Savoy respectively — so the Panslavistic world soon split into a democratic party, aiming at a republican confederation — the result of a general revolution — and a Russian party, aiming at a union created and headed by the Czar. The democratic

scheme, which could be achieved only by the total or partial breaking up of Austria, Prussia, Russia, and Turkey, and against the opposition of both Germans and Magyars, was adventurous and perilous in the extreme, and almost chimerical. The other was decidedly more practical, but it lacked the concurrence of all true liberals and Poles, who dreaded in the event of its success the final absorption of Poland and all other Slavic nationalities in Russia, the victory of Czarism over all its enemies, a centralism worse than that of the Roman emperors, and the triumph of Eastern barbarism over European civilization. But as long as the question remained, so to say, a theoretical one, the Panslavistic movement proceeded almost in harmony, the anonymous author of the "Pentarchy" (Leipsic, 1839) — an agent of Russia — the above-named Slavic writers, and a host of others, among whom we find the Poles Mieroslawski, Libelt, Wielopolski, and the late Count Adam Gurowski, contributing to its advance from various stand-points.

But powerful events soon made this Slavic movement one of the highest importance. The revolutions of February and March, 1848, convulsed the west and centre of Europe, shook the thrones of Austria and Prussia, and gave all power into the hands of the people. In Austria the Hungarians were the first to profit by this change, turning it to the advantage both of liberty and of the Magyar nationality. This led to violent anti-demonstrations on the part of the Croats, Slavonians, and Rascians, who demanded constitutional changes incompatible with the integrity of Hungary. The Austrian government, or rather the court of Vienna, not at all surprised by these dissensions and wranglings, secretly fanned them into a flame which kindled an internecine war of races, in which the Romanic Wallachs, too, took part against the Hungarians. In the meanwhile the Poles of Posen had risen against the Prussians, and had been defeated. Galicia, exhausted by the massacre of her nobles in 1846, remained inactive. The Bohemians now hastened to take the lead in the Slavic movement. A general Slavic congress, convoked by Palacky and others, assembled in Prague. The tendency of the time made it a democratic and revolutionary gathering; no Russians, except exiles, appeared.

But before any important resolutions could be formed a collision between some Czech youths and the Austrian troops, under Prince Windischgrätz, led to a bombardment of the city, the disarmament of the Czechs, and the dispersion of the congress. Emboldened by this victory and by others in Italy, the Austrian government now threw down the gauntlet to Hungary, and ordered the Ban of Croatia, Jellachich, to invade that country at the head of a Slavic army. The Hungarian constitution, the only sheet-anchor of liberty in Austria, was to be put down by semi-barbarous Slavic hordes. At this critical juncture the chasm which separated the two Panslavic camps became apparent. The Czechs, deeming it possible to establish the predominance of the Slavi in Austria, declared in favor of the government, defended by the Croats and Rascians; the Poles, burning to revenge the wrongs of 1846 and to destroy one of their three oppressors, flocked to the banners of Hungary and freedom. And thus, throughout the Hungarian war of 1848 and 1849, Slavi fought against Slavi. The first practical attempt at Panslavism ended in smoke — in the smoke of bloody battle-fields. Russia finally decided against Bem, Dembinski, and Kossuth, and victorious Austria deceived the Croats, Rascians, and Czechs. When the victory was complete, Austria's last word was — Germanization without liberty.

But Magenta and Solferino, in 1859, revenged Temesvár and Világos. Hungary was to be conciliated, or the empire would perish. The House of Hapsburg vacillated and hesitated, until Königgrätz, in 1866, put an end to vacillation. Both Hungary and Galicia were conciliated, the Magyar and Polish elements, united with the German, forming the basis of the liberal system inaugurated under the lead of Deák and Beust; the Czechs and the South-Austrian Slavi were spurned. The Czechs, who even during the Polish insurrection of 1863–64 partly sympathized with Russia, and their southern allies, who had been long dreaming of a South-Slavic empire, to consist of parts of Austria and parts of Turkey, have now turned their eyes towards Moscow and St. Petersburg as the Mecca and Medina of the Slavic world. On their part, the Russian people and government, exasperated by their defeats and humiliations in the Crimean war, by the ingratitude of Austria, and still more

by the threats of Western interference in favor of Poland which became loud in 1863, have now, almost without reserve, espoused the cause of Panslavism, in its Czaric form, expecting through it to revenge past insults, to extinguish the last vestige of Polish nationality, to extend the limits of Russia to the Adriatic and the Bosphorus, to rule, and even to regenerate, Europe. A grand Panslavic gathering, convoked and fêted last year at Moscow, at which even Palacky and Rieger, formerly leading liberal members of the Austrian Parliament, appeared as representatives of Bohemia, and at which high imperial dignitaries spoke in the name of Russia, has made it manifest to the world how far things have gone on both sides. The absence of the Poles, however — only Ruthenians representing, or rather misrepresenting, the Polish provinces — and some later demonstrations of even Czechic opposition, like the recent brilliant pamphlet of Fric, have made it equally clear that the Panslavo-Czaric coalition is far from being acquiesced in by all concerned.

But so much is certain, Panslavism has long ceased to be a chimera. It has become a live idea, agitating eighty millions of people — we exclude the Poles — and perhaps destined soon to shake the world as terribly as Islamism did in the seventh, and again in the fifteenth, century. Of those eighty millions of Slavi, two-thirds, united under the sceptre of the Czar and the emblem of the Greek cross, backed by twenty million fellow-subjects of different race but mostly of the same creed, and aided by ten million Roumanian and Greek co-religionists in Turkey and Austria, are to call to arms — if not to regenerate and annex — almost all the rest of the Slavi (embracing nearly as many Greeks as Catholics), leading them to a deadly strife against Turks, Hungarians, Germans, and Poles. This struggle, if successful, whether ultimately resulting in the regeneration and independence of the south-western Slavi, or, which is more likely, in their subjugation by Russia, would in any case bring about the total ruin of the Moslems in Europe, the fall of Hungarian liberty and supremacy, the extinction of the Polish nationality, the breaking up of Austria, and the destruction of German civilization in the East; it would replace the crescent by the Greek cross on the dome of St. Sophia, would

convert the Euxine into a Russian lake, and make the Czar, whose Cossacks even now guard the banks of the Amoor, the Araxes, the Jaxartes, and the Tornea, the most powerful ruler that ever wielded a sceptre.

Victorious Panslavism, therefore, means not only death to Turkey, Hungary, Poland, and Austria; it also means the domination of Russia and her Church, without a rival able to cope with them, in both Asia and Europe; it means Russian sway over the Aral and the Caspian, the Euxine and the Archipelago, the Baltic and the Adriatic; it means the pressing back of the eastern boundaries of Germany and a menace to her independence. Hence the constant dread of Turkey; hence the opposition of Austria to every step taken by Russia, openly or covertly, in the direction of the Danube; hence the alacrity of the Hungarians and Poles to meet the liberal, and this time sincere, advances of the house of Hapsburg; hence the jealous alarms of France and England, and their readiness to stand by Austria and Turkey; hence the activity of the Catholic clergy in opposing and baffling the intrigues and plots of Russian emissaries in Galicia, Bulgaria, and Hungary; hence the hesitation of Prussia — though she might at first gain by the fall of Austria and the extinction of Poland — to conclude a defensive and offensive alliance with her powerful eastern neighbor, a hesitation which may also keep the new Prince of Roumania — a Hohenzollern prince — from throwing himself into the arms of the Czar.

Will all these opposing forces, coupled with the financial weakness of the Russian empire, long prevent the Czar from crossing the Rubicon, and casting the die of war, urged on, as he is, by vistas of glory, the sting of opposition, and the fanaticism of his people? Will those opposing forces long remain in harmony, or will awakening mutual jealousies paralyze their action? Will an accident bring about the long-delayed fatal collision? Into which of the scales is Prussia likely to throw her weight? Into which is victory likely to throw hers? All these and many similar questions involuntarily present themselves, but it is beyond our powers, as it is beyond our province, to answer them.

Renan's "St. Paul"

"The third volume of M. Renan's *Histoire des Origines du Christianisme* embraces the period of the first great missions to the Gentiles, of which St. Paul is the hero. It opens with the departure of Paul and Barnabas from Antioch in the year 45, and closes with the arrival of the apostle as captive at Rome, in 61. This period of sixteen years the author justly considers the historically best known in 'the embryonic age of Christianity.' Before them lie the shadowy 'images of a remote paradise, lost in a haze of mystery,' which he has reproduced in the pages of the 'Vie de Jésus' and 'Les Apôtres'; after them follows a long night of profound darkness, through which only 'the bloody shine of Nero's savage feasts,' 'the thunderbolt of the Apocalypse,' and the torch which destroyed the temple of Jerusalem, dart their lurid light. These few visible traits, together with the dimly transparent features of the last years of the apostles, are to form the main subjects of the fourth part of the 'Origines,' which the author hopes to complete in a fifth volume, closing with 'the definitive establishment of dogmatic orthodoxy.'

As a work of literary art — whether we consider the composition of the whole, the elaboration of parts, or the coloring — 'St. Paul' could but with difficulty obtain the distinction of surpassing its two predecessors, for the sole reason that, as works of art, these could hardly be surpassed; and yet we have no hesitation in saying even that distinction must be awarded it. We forbear, however, specifying the grounds on which we base our judgment. The consummate mastership in planning, arranging, and delineating, these charms of diction, can be felt, but can hardly be described, except, indeed, by expressing the impression they produce on the reader. And yet it is chiefly as a product of historical criticism that we must declare the 'St. Paul' decidedly superior to both the 'Jésus' and the 'Apôtres.' And here we can specify our reasons. First, M. Renan has, during the elaboration of these volumes, considerably augmented the vast stock of knowledge with which he entered upon this field; secondly, he has in the same proportion chastened his

critical fancy; thirdly, he has left behind him that part of his ground in which the adoring believer may find rich materials for the adornment of his temples, and the iconoclastic critic equally abundant fragments to exercise his irreverent art upon, but which offers no material out of which historical monuments — both true and unhallowed by faith — could be shaped by a process, however, ingenious, of reconstructive art.

As idyls — accompanied by erudite notes and critical introductions, as fanciful pictures of a 'pastorale délicieuse' — as M. Renan designates the life of the earliest followers of the Son of Man — the 'Jésus' and the 'Apôtres' are really charming productions. It matters nothing that the idyl sometimes almost loses its character, and is, almost imperceptibly, changed into an epic. Idyllic and epic elements are not incompatible in poetry; the picture of the origins of an Utopia must be both epic and idyllic. But Utopias are, unfortunately, only creations of poets or visions of prophets. The Golden Age, the commonwealth of Plato, the 'last days' of Isaiah — none of these belongs to the domain of history. And no 'grande épopée' of human history, from Moses to Napoleon, has been idyllic; least of all the French Revolution, with which M. Renan so much likes to compare the revolution he depicts. And yet it is for history — critical history — that he endeavors to palm upon us those delicious pastorals. As history, they are far from being delicious — if in fact they are not quite the contrary. The ingenious processes by which our author transforms rugged, rude, and ignorant Galilee — the Galilee of the procurators, the *sicarii,* and exorcists — into an earthly paradise, full of love and joy and sunshine, numberless miracles into natural facts, and all kinds of psychological or historical incongruities into apparently logical developments — those processes are equalled in uncriticalness only by the method he applies in examining ecclesiastico-traditional testimony, and which makes him so often enter as historical a small part of an evidence the bulk of which he rejects as forged, falsified, based on superstition, or altogether incredible. M. Renan, without any qualification, rejects as incredible everything supernatural; but the shadows that accompany the delineations of supernatural things he saves, and — quite as artfully as artistically — works them into new

images. His new images are often excellent imitations of the sacred ones he tears; but while orthodoxy must spurn them as devoid of all sacred substance, mere unimpassioned criticism, too, can see in them little more than shadows. The age of Jesus is a fit subject for the pen of sceptical historians; his life can be written only by a believer, for all we have about him comes from unconditional believers.

It is different with the life — or, rather, the career — of Paul. The main and most historical part of it — that which has exercised so vast an influence upon the development of Christendom and the world — can probably well be traced. The earlier part — that embracing his Jewish life, his miraculous conversion on the road to Damascus, and his Christian activity in Syria — furnishes, in M. Renan's elaboration, some of the epic tableaux of the 'Apôtres' — with the change, of course, of the grand miracle into a natural, though a very strange, occurrence. The mystery-covered close of the apostle's career is wisely left to take its place among the dim appearances of Christian life in the following period. The volume before us sketches after tolerably authentic documents — M. Renan rejects only the Epistles to Timothy and Titus as entirely spurious — the period of Paul's missionary wanderings through Cyprus, Pamphylia, Pisidia, Lycaonia, Cilicia, Phrygia, Mysia, Thrace, Macedon, Greece, Ionia, Lydia, and Syria — countries through which, with few exceptions, the biographer expressly followed the footsteps of his hero before writing this book; the period which witnessed the foundation, among others, of the primitive Christian communities of Philippi and Thessalonica, of Athens and Corinth, of Ephesus, Colossæ, and Laodicea — cities to the description of some of which charming pages are devoted; the period which gradually developed and matured that anti-Mosaic and anti-Judaic form of Christianity, of which, according to M. Renan, Paul, and not Jesus, was the father, basing it on grace and justification by faith, preaching it to the Gentiles, and passionately defending it against the authority and hostility of the original apostles — the strict but 'narrow-minded' followers of both Jesus and Moses. In this period there are but few miracles to be rejected, transformed, or ignored; there is no divine image to be painted over into that of an angelic man;

the scene is no Arcadian Galilee; there is no Mary of Magdala; the hero is a very unamiable rabbi.

The reader of the 'Apôtres' will remember the portrait there given of the short, somewhat crook-backed, broad-shouldered, small-headed, thick-bearded, and bald Jew of Tarsus, who, as Saul, gloated over the agonies, promoted by himself, of the first Christian martyrs, but, as Paul, was destined to become the disseminator, the great light, of Christianity — the teacher, in distant ages, of Wyckliffe, Huss, Luther, and Calvin. His character, as developed chiefly in the book before us, is far from being the exact counterpart of that unattractive exterior. Paul has changed his religion, but he has not given up his fanaticism. He does not persecute, for the powers that be are against him; but he is passionate, impetuous, vehement, rude, and not incapable of violence. He preaches love and charity, and preaches them in words that alone 'can be compared to the discourses of Jesus'; but he seems himself to be inaccessible to all tender emotions. He boasts, and justly so, of grand sacrifices and endless sufferings for the cause to which he has devoted his life; but he is egotistic, jealous, obstinate, contentious. He combats the exclusiveness of Judaism, but without giving up its prejudices. He believes salvation possible only under his own formulas, inveighs against the yoke of the law, and yet often makes concessions, breaks his own rules, and compromises with superstition and untruth. He exorcises, heals, and does apparent miracles. Nor are his convictions and beliefs such as could appear particularly attractive under the pen of a Renan. His theories of sin, indulgence, faith, justification, grace, and redemption; his ideas of marriage, celibacy, and temptation; his belief in miracles, demons, angels, the bodily resurrection of Christ, and the approaching end of the world — all these are little to the taste of unbelieving philosophy, and M. Renan hides neither his tastes nor his philosophy.

And yet, thanks to the wonderful skill with which he handles his pen — as if it were a magic balancing wand, capable of carrying one safely over the double abyss of decided belief and decided unbelief — and thanks, also, to some indisputably grand mental qualities of his hero, he succeeds in representing him to his readers in a rather brilliant light. He almost passionately

sides with him — who 'never saw Jesus, nor heard his word,' 'scarcely knew his parables'; who preached revelations of a Christ who 'was his own phantom,' and 'heard himself while believing he heard Jesus' — in his great contest with Peter, James, and other true Apostles, the pillars of the Church of Jerusalem. He even goes to the length of suspecting the bigotry of that Judaizing circle of complicity in the surrender of Paul to the Roman authorities. Altogether, the Apostles of Jerusalem cut a rather pitiable figure in the new volume of the 'Origines,' and, contrasted with them, Paul easily appears not only the liberator of Christianity, but its very genius.

Looking at the situation from M. Renan's critical standpoint, we must say, however, that he does the Apostles of Jerusalem injustice, and unduly extols their antagonist. We cannot perceive what should have induced them, who lived in the still undestroyed state of Judea, under the law, which was both religious and civil, and which they had seen Jesus observe to his death — what should have induced them to desert the divine institutions of their country and people, that had been binding from times immemorial, for the sake of a new-fangled reform, the fruits of which the world could not enjoy, as it was incontinently to come to a terrific end. Nor can we see what rational ground might have led Paul to use much violence — or, on the other hand, to make so many concessions — in carrying through that reform, while fervently admonishing his converts to live a provisional life, without attempting any change of condition — be it even through marriage — for the time was short, and the world as it was, was passing away. The truth is, the great fault of M. Renan in judging men and ideas of that time is his involuntary viewing them from the standpoint of a philosophical observer who has eighteen centuries of Christianity behind him. Looking upon a Christianized world, he eulogizes him who sacrificed everything to the universalization of the liberating faith, and casts stones at those who, from narrow-minded piety, laid obstacles in his way — forgetting that, according to his own statement, the number of all the Gentiles converted by Paul probably amounted to little more than a thousand, and that these converts mostly belonged to the lowest and most powerless stratum of society. And there is nothing in M. Renan's narra-

— without prophetic gifts, in her 'the twelve' or the great of what the philosopher knows; momentarily waiting for the end

m calling attention to the num- nd generalizations interwoven m exposing the glittering shal- nowledge is more extensive and his materials from stores both e is not always conscientious in he ease with which he creates m to be lavish in multiplying on the beautiful, and is almost there is something like hidden — though his religious scepti- Voltaire or Gibbon. We might red history."

anco-German war of 1870–71 the *Nation* assumed an even e wrote many of the leading l aspects of the struggle, and ntion. The first of these, re- a German translation, in the

SES OF THE WAR

" Louis Napoleon quotes from Empire, Bignon's, the follow- Why did Napoleon, in the last elf so pitiless towards Prussia? power that harmed him most, and destroy her, while his de- h, and to aggrandize her." We of the " Idée Napoléonienne," mence drawn the sword against erally passionless as he is — has

either the desire or the ability to treat her pitilessly and to destroy her; but — granting Bignon's view to be correct — we cannot fail to notice the analogy between the Prussian wars of the two imperial reigns arising from the fact that Napoleon III., too, sees himself compelled to fight Prussia after some endeavors "to extend, to strengthen, and to aggrandize her."

The object of Napoleon I. in giving Hanover to Prussia, after Austerlitz, was, as Bignon expresses it, "to ensure, by her aid, the immobility of Russia and Austria, to give to the Continental system an irresistible development, and thus to force England to make peace." Besides, Napoleon received some territorial compensations for what he took from the King of England and gave to Prussia. The object of Napoleon III. in conspiring with Bismarck for the aggrandizement of Prussia — by the absorption, among other territories, of the same Hanover, as chiefly required for her consolidation — was to bring about a final disruption of Germany, which would render her powerless to resist the natural expansion of France — as the French call Cisrhenan conquests — whether at the expense of Belgium or of Prussia herself, should a protracted war have crippled her resources equally with those of Austria. And, low though our opinion be of the unselfishness of the living Napoleon, we cannot refrain from acknowledging that his intentions concerning Prussia were more sincere than those of the great conqueror. For the latter aimed at universal empire over Europe, and could therefore tolerate no respectable power besides his own, while the former would be fully satisfied to be acknowledged mightiest among the mighty.

Prussia compelled Napoleon I. to fight her by refusing to be his abject slave. She has compelled Napoleon III. to fight her by her victory at Sadowa. This victory by its suddenness has frustrated the schemes of French expansion, and made Prussia almost the equal of France in power. It has eclipsed Sevastopol, Magenta, and Solferino — which were the dearly bought compensations in *gloire* for endless sacrifices of *liberté* — and partly effaced even the remembrances of Jena and Wagram. It has aroused the vanity of the French to a degree which makes them both restless and restive. The trophies of Miltiades will not allow Themistocles to sleep; from the day of Sadowa France

has enjoyed no rest. She has actually begun to doubt whether she is after all *la grande nation*. A great revolution and great victories long ago procured her that glorious title; she sees it now rapidly becoming vain-glorious merely. She must have new victories or else a new revolution. Napoleon has not been slow in comprehending the changed situation, the changed temper of France. And where revolution or war is the alternative, he cannot hesitate in his choice. While playing or struggling with an incipient revolution, he has prepared for war — and Europe will be drenched in blood. It is idle to speculate how far, in throwing down the gauntlet to the rival of France, he is actuated by motives of personal interest, looking to the preservation of his dynasty, and how far by feelings inspired by the interests of the nation whose ruler he is. Whether equally imperative or not, regard for the safety of his throne and regard for "the honor of France" command him to fight.

Among the personal considerations looking to the preservation of both throne and fame, we may mention the advantage, so obvious under the actual circumstances of the Second Empire, of breaking by a powerful series of warlike deeds the chain of historical remembrances now uppermost in the mind of the French people. The seventeen or eighteen years of the personal rule of Napoleon, beginning with the *coup d'état* of Dec. 2, 1851, form a connected period of usurpation and hypocrisy, preceded by three years of wire-pulling and presidential betrayal of trust. This period is that which the generation that knew the reign of Louis Philippe and the Revolution of 1848 is constantly contemplating and meditating about as the worst part of their country's history in this century; as a long-stretched inglorious present to which the late imperial concessions, crowned by a plebiscitum of a strangely dubious character, seem to form a continuation rather than a concluding and reconciling epilogue. Nothing would be more apt to impress upon the recent constitutional change in France the character of such an epilogue than the suddenly following opening of a new series of events, sufficiently dramatic and heroically tragic to strike the imagination of the people with the idea of entirely novel, grand performances, with the impression of a new era opening in the history of their country. Should speedy victory

perch upon the imperial eagles, the new era would be hailed, as such, with all the rapture of national vanity; should a long war with varying success ensue, the multiplicity and intensity of the new impressions would the more easily cast the late past into comparative oblivion. In either case, Napoleon would appear in the new light of a champion of France in a grand contest with an envied rival.

Nor have the provocations to hostility, on the part of Prussia, been slight in the eyes of Napoleon. Not only has she dared to conquer beyond all measure compatible with "the honor of France"; not only has she used and abused her victory exclusively for her own benefit and without any regard to the claims and remonstrances of the monarch who at first aided her by his council and connivance; but she has also crossed and baffled some of his most favorite schemes in an almost atrocious way. It was he who proclaimed himself the protector and regenerator of the decayed Latin race, from the Pontus to the Pacific. It was he who brought about the union of Moldavia and Wallachia in the shape of an all but independent Roumania. It was he who worked with Cavour and fought with Garibaldi for the freedom of Italy, "from the Alps to the Adriatic." It was he who encouraged O'Donnell to revive the ancient glory of Spain on the soil of the Moors and to restore her sway in the Antilles. It was he who erected and defended, as a shield of the Latin race against the Anglo-Saxon, the imperial throne of Maximilian in Mexico. Surely it was a great dream, this universal Latin protectorate of France. And how has it vanished? Excepting Mexico, where it ended in a tragedy, Prussia has turned it into a mockery everywhere. She has placed a prince of her royal house, Charles of Hohenzollern, on the throne of Roumania. She has conquered — at Sadowa — the Italian quadrilateral of fortresses, which her arming in 1859 prevented Napoleon from assaulting, and has surrendered it and Venice to Italy — through his own hands. And now she has arranged to set another Hohenzollern prince on the throne even of Spain. Are not all these provocations, put together, too destructive of the prestige, too insulting to the pride of a Napoleon to be submitted to calmly, to be borne without an attempt at revenge? We presume they have weighed heavily

in the scales in which the Emperor of the French lately weighed peace and war.

The article which follows is a striking presentation of a subject of permanent interest. Mr. Heilprin masses, with telling effect, the lessons of history and geography in support of his thesis that mountains, not rivers, form natural barriers between countries.

Natural Boundaries

When the power of Napoleon I. was rapidly crumbling away after the crushing defeat at Leipzig, the allies, halting at Frankfort before entering upon the last campaign, offered him, for peace, the undisturbed possession of France, with her limits extended east to the banks of the Rhine. The France thus offered him would have been almost coextensive with ancient Gaul, which was bounded by the Rhine, the Alps, and the Pyrenees, and would have embraced, besides the French Empire as it now is, the whole of Belgium, portions of the Netherlands, Luxemburg, and Rhenish Prussia, Hesse, and Bavaria. Napoleon, in his unreasonable pride, spurned these terms of peace, and when, a few months later, he presented them as his own to the Peace Conference at Châtillon, they were rejected by the allies. Napoleon fell, and the kingdom of the Bourbons was ultimately reconstructed as it had been before the wars of the Revolution. But since that time France has not ceased dreaming and talking of her natural boundaries — the Pyrenees, the Alps, and the Rhine. And this has not been the idle dream and idle talk of popular vanity and demagogism merely; statesmen, historians, publicists, and poets have vied with each other in making France believe that she had a natural right to all the lands west of the Rhine, and the dire consequence of that fondly cherished delusion is the present war.

We call it a delusion, for the Rhine is not a natural boundary of France in a rational sense of the word. Nor are rivers, in general, the natural boundaries of countries. Rivers, it is true, form excellent geographical lines of demarcation between provinces or other divisions of one and the same empire, king-

dom, or confederation, such as are the lines of the Ohio and the Mississippi, which bound some of our non-original States. But they are no more real lines of separation than are the meridians of longitude or parallels of latitude which have been selected to bound other States of our Union. For rivers, and especially navigable rivers, far from being separating barriers, are natural channels of intercourse and intermingling, of coalescence and union, the world over. Comparative geography, a science of rather recent development, has fully established this axiom. If used as real barriers, as the Rhine and Danube were by the Romans against the barbarians, and the Ticino and Po by the Austrians against Italy, they form unnatural barriers — that is to say, *unnatural boundaries* — kept up and guarded by the sword of the conqueror, occasionally long enough to become, or at least to appear, natural. Watersheds, not rivers, form natural boundaries. Mountain ranges separate nationalities. The same nationality almost everywhere flourishes on both banks of every navigable river. Every basin, or at least every section of a basin, has its character. The inhabitants of the slopes that hem it in will fuse with the dwellers in the bottom. People living on the opposite slopes of a mountain range will tend in opposite directions.

The whole of history and geography, studied together, proves it. The Nile has never nourished two different nationalities on its opposite banks; it has never been the boundary of an empire. Babylonia flourished on both sides of the Euphrates; Assyria on both sides of the Tigris. The Hebrews occupied both banks of the Jordan. Neither the Oxus nor the Jaxartes, neither the Indus nor the Ganges, neither the Yan-tse-kiang nor the Ho-ang-ho, has ever formed a boundary between different nationalities, or separated different civilizations. It was not the river Eurotas, the Alpheus, the Cephissus, or the Peneus, but mountain ranges like the Taygetus, the Pindus, and the Œta, that formed, by bounding, the wonderful system of Grecian autonomies. The various sections and branches of the Apennines mainly separated the ancient national divisions of Italy. Rome developed its power on both banks of the Tiber; the Po, in forming Cispadane and Transpadane Gaul, bounded provinces but separated no nationalities; the little rivulet

Rubicon only marked the end of a frontier line formed by the Apennines, just as the little Tweed in the Middle Ages served to complete the natural boundary line of the Cheviot range between England and Scotland.

Mountain ranges, not rivers, formed, in the Middle Ages, the grand divisions of the Iberian Peninsula. The Ebro flows not on the confines but through the midlands of Aragon; the Guadalquivir does not bound but traverses Andalusia; Castilians live on both sides of the upper Douro and Tagus, Portuguese on both sides of the lower. The countries of Eastern and Central Europe show striking parallel examples. Russians inhabit both banks of the Volga and the Don, Poles both banks of the Vistula; Germans both banks of the Oder, the Elbe, the Weser, and the Rhine. The Danube flows through the very centres of Würtemberg, Bavaria, Austria, and Hungary. The last-named polyglot country owes its national unity mainly to the encircling wall of the Carpathians; all its rivers flow towards or through its central bottom lands, and thus keep up a union even of the most heterogeneous elements. Bohemia is a mountain quadrilateral.

The mountain and river systems of the rest of Europe confirm the rule, with hardly a single exception. Neither do those of America invalidate it. That the Father of Rivers is a mighty bond of union instead of a barrier of separation, is acknowledged on all hands. The same is the case with the Missouri. A glance at the map will show that the St. Lawrence is only a figurative boundary line between the United States and the British Provinces, and that it flows through the latter. The Rio Grande is a frontier line dictated by recent conquest, and Indian tribes continue to roam on both its banks. Rivers selected as State lines are too feeble even as barriers between communities. The lower western bank of the Hudson is lined with suburbs of New York City. Camden is a suburb of Philadelphia; Covington, of Cincinnati. In South America, the Amazon and the Orinoco offer parallel instances to the Mississippi and the St. Lawrence. Some branches of the La Plata alone can be said to form exceptions, but recent events indicate that even these are not to last.

To return to the natural boundary between France and Ger-

many. It is clear that the Rhine is far from forming it, either geographically or historically. The natural geographical boundary line, irrespective of the now existing nationalities is the watershed between the Meuse and the Aisne and Marne, and its easterly continuation between the head-waters of the Saône and Doubs, on one side, and those of the Moselle and Ill, on the other. All of France that lies east and north-east of this watershed — the main parts of Lorraine and the whole of Alsace — belongs to the water system of the Rhine, a river both banks of which, from its source to its mouth, are inhabited exclusively by Teutonic people — Swiss, Germans proper, and Dutch. Historically, the lands watered by those western affluents of the Rhine formed, after the downfall of the Roman rule in Gaul, parts of the Frankish realm of Clovis, and subsequently of its eastern and purely German division, Austrasia, while the valleys of the Seine and of its numerous affluents formed the much more Gallic western division, Neustria. The Carlovingian Empire embraced both divisions, but after its final disruption during the period of partitions inaugurated by the Treaty of Verdun, Austrasia was merged in Germany, while out of Neustria gradually grew up the modern Kingdom of France. And both Alsace and Lorraine — the latter in its main parts — continued to belong to Germany down to the time when French centralization, developed by Louis XI. and perfected by Richelieu, proved itself decidedly superior to the more and more loosening machinery of the Empire — the final annexation of the two provinces to France taking place under Louis XIV. and Louis XV. respectively. The inner territories of Lorraine have since become almost entirely Gallicized; Alsace is French in sentiment, though not in language, and the section of the Rhine which bounds it on the east has assumed the semblance of a natural boundary, but the semblance only. The possession of the western bank of this river section has stimulated the desire of making the Rhine the eastern boundary of France. The constant threatening to achieve this conquest as an act based on a natural postulate has awakened, even in the more moderate portions of the German people, the thought of re-establishing, on an opportune occasion, the natural boundaries between Germany and France as they were before the

Peace of Westphalia. It is beyond the sphere of this article to discuss the questions whether the present is the opportune moment to do it, and whether it would at any time be just or expedient to do it against the will of the populations concerned.

One of the most notable of Mr. Heilprin's editorials on the war was the following:

Will "the Miracle of 1792" Repeat Itself?

In the summer of 1792, France was partly invaded and partly threatened by armies of an extensive coalition. Prussia and Austria were marching against her; the Empire and the King of Sardinia were ready to join them; Spain, Rome, and Naples were expected to follow suit; Russia promised aid to the invaders; the English Parliament rang with thundering appeals against the invaded. In one word, the whole of Europe seemed to enter upon a crusade against an isolated state, and that a state convulsed and shaken to its very foundations by an unparalleled revolution, a state whose ruler was a captive in his own blood-deluged capital, whose army was demoralized and half-disbanded, and whose legislature was dictated to by frenzied mobs. Revolutionary France seemed to be lost, her leaders doomed to terrible vengeance. But revolutionary France, instead of sinking upon her knees before Europe in arms, only redoubled the inner fury which seemed to consume her, and by dint of that fury drove the foe beyond the frontier, and carried war, convulsion, and freedom into the lands of the invaders. The world was astounded by this extraordinary phenomenon, and even posterity calls it still "the miracle of 1792." And at the time of our writing, seeing France again invaded, convulsed, and menaced in her integrity and with but slight chances of an ordinary escape from the terrible consequences of folly and disaster, the observer, led by a more or less sympathetic curiosity, anxiously asks himself and history, Is there much probability of the miracle of 1792 repeating itself? Can France, the ensnared giant, once more arise like a Samson, and by one grand exertion shake off the foes? The answer of history, if studied with candor in connection with the present, is — we must state it — sadly discouraging to the friend of France, and that on various grounds.

First, the invasion of 1792, compared with the one which last month laid low the armies of Napoleon III., was far from being in any degree powerful, in spite of the vast dimensions it apparently assumed. The armies sent against France were neither numerous nor brought up in the school of victory; their movements were slow and vacillating; their commanders pedantic or imbecile followers of an old traditional strategy, which became entirely worthless when the genius of revolution created its own in the French camps; the monarchies which sent them were as hostile to each other as they were to the common enemy. The stupid intermeddling of the French refugees, who were so influential in bringing about the coalition, the intrigues of the wretched statesmen — Thugut, Haugwitz, Lucchesini, and others — who at that time managed affairs at the courts of Vienna and Berlin, the secret plottings of the allies against each other, and the rivalries of the respective commanders, made all harmonious action by the Prussian and Austrian armies impossible. The mere resistance of Kellerman to the cannonade at Valmy sufficed to cause the retreat of the Prussians under the Duke of Brunswick; and Dumouriez's indecisive fight at Jemappes, to throw the Austrians, under Clairfait, upon the defensive. The first — endangered minor members of the Empire — the clerical electors of Mentz and Treves, and the Palatine — afraid of their own plundered and outraged subjects no less than of the French republicans, abandoned their territories without daring to strike a blow. The troops of the Sardinian despot were driven from Savoy by his own revolted subjects. Spain engaged in the war only when victory had declared in favor of the Republic, and then under the auspices of Godoy, a queen's favorite, of whom it was believed — Lord Holland relates it — that, as Minister of Foreign Affairs, he did not know the difference between Russia and Prussia. Rome and Naples hesitated, as became their impotence, and, when Spain was beaten, wisely preferred to do nothing. Catharine was too much engaged in fighting and dismembering Poland to keep her promise on Western battle-fields; and England, when she resolved on war, could do little more than waste her treasures on worthless allies, who finally betrayed and deserted each other. And is it necessary, in order to show the vast difference between the invasion of 1792

and that of 1870, to draw parallels between that tool of charlatans and mistresses, Frederic William II., and William I.; between the Prince of Coburg and Moltke; between Lucchesini and Bismarck; or between Valmy and Jemappes and Gravelotte and Sedan?

And then, in fighting the ill-commanded, scattered, and disunited forces of the then degenerate, womanish, and generally priest-ridden courts of Vienna, Berlin, Turin, and Madrid, revolutionary France drew her courage, inspiration, and boldness not only from her first, almost unexpected military successes, but from deeper and mightier sources. These were — the necessity of conquering or perishing, of destroying or being destroyed; the fanaticism of new ideas, more powerful than any that had ever agitated Europe, ideas which acted with the magic of a world-regenerating revelation; the intoxication with which the recent victories, in the name of equality and fraternity, over caste, the throne, and the altar had filled the masses of the self-disfranchised people; the concentrated power of volcanic forces which an all-crushing terrorism knew how to elicit from the scattered members of a nation suddenly aroused to terrible self-consciousness; and, finally, the certainty of meeting with allies burning with equal passions wherever a breach could be made in the ramparts of effete tyranny. At the moment when Ferdinand of Brunswick began his retreat, retiring like a lamb after having roared like a lion, the Convention met, and decreed a new era for France and the world. France believed in it, and her hosts carried their faith triumphantly far beyond her borders, as the followers of Islam had carried theirs from Mecca to the Pyrenees.

Now, all these sources of inspiration and success are wanting to the menaced France of to-day. She has not only to fight well-organized and well-led armies, flushed with patriotic enthusiasm and the pride of wonted victory; she has not only met with crushing and humbling reverses at the very opening of the contest; but, what is worse, she is devoid of even a spark of that fanaticism which saved her in 1792, and made Paris a world-shaking volcano in the following years. She entered the lists with a bad conscience, and debauched and enervated by twenty years of the most degrading of tyrannies, and that a tyranny

based on mere materialism, and accepted from political apathy and cynical unbelief in ideas; and she has now, in this supreme crisis, no other moral resource to fall back upon but ordinary patriotism, a sentiment capable of great sacrifices, but not of miracles. The grand ideas which by turns inspired or agitated France after 1789 have all sadly spent their force. The republic, instead of founding fraternity and freedom, led, in the first instance, through the massacres of Paris, the *noyades* of Nantes, the *mitraillades* of Lyons, and the like, to the 18th Brumaire; in the second, through the 10th of December, 1848, and the 2d of December, 1851, to the ignominious self-abdication of the sovereign people in 1852. Bonapartism — that is, "la Gloire" — ended, in the first instance, after the sacrifice by France of millions of her sons to that idol, with the surrender of Paris and the captivity at St. Helena; and, in the second, with the more humiliating surrender at Sedan and the farcical captivity at Wilhelmshöhe. Revived Bourbon legitimism killed itself, in July, 1830, by its own stupidity. Orleanism, which replaced it, showed its inherent want of vitality by being swept away by a slight revolutionary blast, in February, 1848. Socialism made itself hateful by leading to the carnage of June, 1848, in which it was stifled; and universal suffrage lost all its sanctity by sanctioning every act and demand of triumphant usurpation. And, to make the case worse, while France is without faith and without enthusiasm, the enthusiasm of her foes, the Germans, and their proud belief in their own intellectual and military superiority, have risen to a pitch never before reached, and are productive of astounding displays of energy.

At the moment, too, when France has to make her supreme effort, her organism, as of late constituted, finds itself almost fatally deranged, not to say destroyed. Paris, which has become both her head and heart, is, so to say, severed from the trunk of the country, and its other disjointed members, from which the effort is expected, are left palpitating, but without sufficient life of their own. This condition is owing to the stupendous centralization which the Revolution created, the First Empire developed, and all subsequent reigns strengthened, and which, radically transforming the organism of the nation, has finally almost entirely drained the provinces of brains, impulse, and

self-directing power. All authority — military, judicial, or administrative — all political or intellectual leadership — all higher talent, in whatever branch of mental activity — has been turned into that one grand reservoir, Paris. All French men of eminence in the ruling spheres of national life are Parisians by education or in consequence of their public career. The country is accustomed to receive from that all-directing centre its administration, its guidance, its convictions, its intelligence, its impulses, its very life-blood. All this, again, was vastly different at the time when revolutionary France was invaded and menaced. There was life, independent vitality, and animation in all her limbs, and the common focus, Paris, served to unite and regulate the national forces without anywhere exhausting them. Nay, Paris at that time received its inspiration, its greatest intelligence, its violent impulses, in main part, from the country, which teemed with talent and passion. The first armed resistance to the absolutism of Louis XVI. came from Dauphiné and Bretagne. Provence sent to Paris the most powerful orator of the time, Mirabeau, and the almost equally eloquent Girondists, Isnard and Barbaroux. Vergniaud, Guadet, and Gensonné, the foremost leaders of the Girondist party, came from the department from which it derived its name; their able and noble-hearted associate, Lanjuinais, from Rennes; Buzot, from Evreux; Pétion, from Chartres; Roland, from Lyons. Bretons formed the club out of which that of the Jacobins was developed, and the most terrible of terrorists, Barère, Merlin de Thionville, Billaud-Varennes, Fabre d'Eglantine, and Robespierre himself, with his two nearest associates, St. Just and Couthon, were provincials, as were also the most conspicuous clerical revolutionists — men widely different in character — the Abbé Grégoire, Bishop Talleyrand, and the capuchin Chabot. Mme. Roland and Charlotte Corday came from the provinces, and so also "the organizer of victory," Carnot, and its great promoter, the Marseillaise. For such abilities and passions it is vain to look to the country districts of the France of to-day, while Paris is isolated, paralyzed, and perhaps on the eve of a surrender. Patriotic endurance, blunders on the part of Prussia, and the intervention of disease or of foreign powers, may still restore France in her integrity; but

salvation through a repetition of "the miracle of 1792" seems to us as little possible as salvation through the appearance of another Joan d'Arc.

Articles on Military Affairs

In addition to his leading articles during the war and many book reviews, Mr. Heilprin contributed to the *Nation* every week editorial notes which, closely following the military movements of the great armies, formed unquestionably the most accurate comment on them which appeared in any American paper. His extraordinary geographical knowledge and a predilection for strategic studies previously acquired stamped these contributions as altogether unique, and they were widely noticed. I remember that a prominent West Point official, who himself during that time contributed a series of valuable "Notes on the War" to the *Nation*, over the signature of "D. H. M.," while in the office of that journal one day, asked Mr. Garrison who the strategist was that wrote those remarkable military comments on the progress of hostilities. Mr. Garrison pointed to Mr. Heilprin, who stood next to him, and introduced the two writers to each other. I quote at random a few of these editorial notes, from the issue of September 22, 1870:

"The war is vigorously carried on by the Prussians, but merely by marches, investments, and sieges; for no battles take place, the French forces in the field, wherever and whatever they may be, being still paralyzed by the stunning effects of the disasters which terminated the Empire. No Army of the Loire, no Army of Lyons, has as yet made its appearance in the neighborhood of the Prussian camps. No flying detachments, no partisan bodies, have anywhere attempted to pierce the enemy's extended lines of communication, or even to harass his flanks. Even the isolated German army corps which carries on the siege of Strasbourg is left entirely unmolested by any attempt at a rescue or a diversion, which the gallant defenders of that fortress would so well deserve; and the most important cities of the Upper Rhine, Colmar, Mulhouse, and Belfort, have been abandoned without a blow to an insignificant force of Baden

troops. Thus almost the whole of Alsace is now in the hands of the Germans. Of the towns mentioned, Belfort is the most strategically important, forming, as it does, a kind of gate to the province, from the side of Besançon and Vesoul. The reports about Schletstadt are conflicting.

The siege of Strasbourg seems to be pushed forward with the utmost vigor, which renders its obstinate defence the more worthy of praise. Metz, too, withstands with gallant firmness, though the hostile circle around it is tightening from day to day, and gradual exhaustion within must be getting no less alarming. Sickness thins the ranks of both besieged and besiegers. The Prussian grip appears to be the strongest on the south-west and south, on both sides of the Moselle, from Gravelotte, by Ars, to Courcelles; which is quite natural, as a breaking through of French forces on the north could only lead to their surrender on this side or the other of the Belgian frontier, while an escape south, were it possible, might prove both ultimately successful and destructive to the Prussian position between Toul and Strasbourg. No attempt of this kind, however, has been made by Bazaine since his repulse at the close of last month, and the reported escape of Canrobert, with six thousand men, marching straight on Paris, was but a foolish piece of fiction. A small balloon with soldiers' letters from Metz is announced in Paris to have been caught near Neufchâtel (*sic*, probably for Neufchâteau, in the Department of Vosges), conveying among encouraging expressions the surest evidence of the complete investment of that fortress. The Prussians are also making great efforts to reduce Toul, in spite of which this little stronghold continues its brave resistance. Its example is imitated by Soissons, which the Prussians seem to have completely invested. Against Verdun no new attempt has been made. Were there any active French forces left in the field, the position of the invading armies would be greatly endangered by the garrisons in their flank and rear.

But the only considerable force of combatants besides Bazaine's, in Metz, which is still to be encountered in the northern

half of France — the southern is now a kind of *terra incognita*, much fabled about — is now enclosed within the fortifications of the capital, and almost entirely surrounded by the main forces of the invasion; for the Associated Press telegram from Paris, of the 16th, according to which 'all the regular troops, as well as the Francs-Tireurs, have left' the city, to fight in the field, seems as little deserving of credit as the statements accompanying it — that 'all non-combatants' have been ordered to leave; that 'the forests around the city have been entirely consumed'; that a number of vagrants, lately expelled, 'endeavored forcibly to re-enter Paris, but were driven away by the troops'; and that Trochu received 'the advance-guard of a corps of 10,000 American volunteers.' And the coil of the Prussian armies which is to encircle those fortifications — of course, not without considerable gaps, which might prove fatal to the enterprise were Trochu's troops of the right mettle — and to menace their weak sides, is hourly drawing closer and closer. Fighting — on a small scale, it is true — is already going on in the very suburbs of the city, to which nearly all approaches by rail have been cut by the enemy, the bridges around being blown up by the French themselves. Cannonading and skirmishing have taken place around Villeneuve, Ablon, Athis-Mons, and Juvisy, on both sides of the Seine, the Prussians evidently endeavoring to occupy the hills south of Paris, on which batteries can be planted against the forts of Bicêtre, Ivry, and Charenton. They have also appeared in force at Creteil, near the Marne, about three miles to the south-east from the last-named fort, while the fort of Vincennes, to the north-east of Charenton, is reported blown up as untenable. The gap thus created between the forts on the south-east and the forts on the east — Rosny, Romainville, and Noisy — Trochu seems to intend to defend by the strongest portion of his army, while other portions will have to be detached to the opposite side, where the fortifications between Forts Issy and Mt. Valérien have, from the beginning, been defective. Nor can the woods of Clamart and Meudon, adjoining Forts Issy and Vanves, which heavy rains prevented from being burned, definitively be abandoned, for they would offer a shelter to the enemy, whose advance-guard has already appeared in that vicinity, as well as at Versailles and various adjoining places. The

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such as those on "How the
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The New German Empire,"
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araguay," Laveleye's "Prus-
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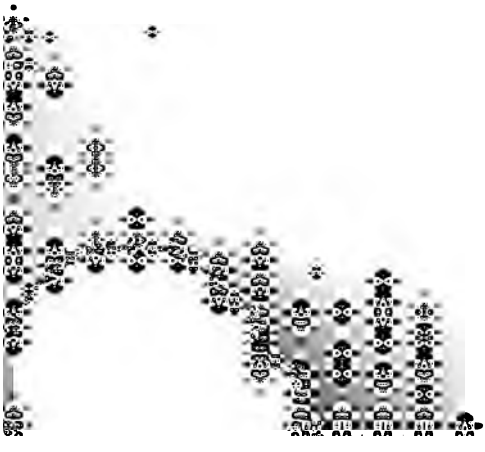


III

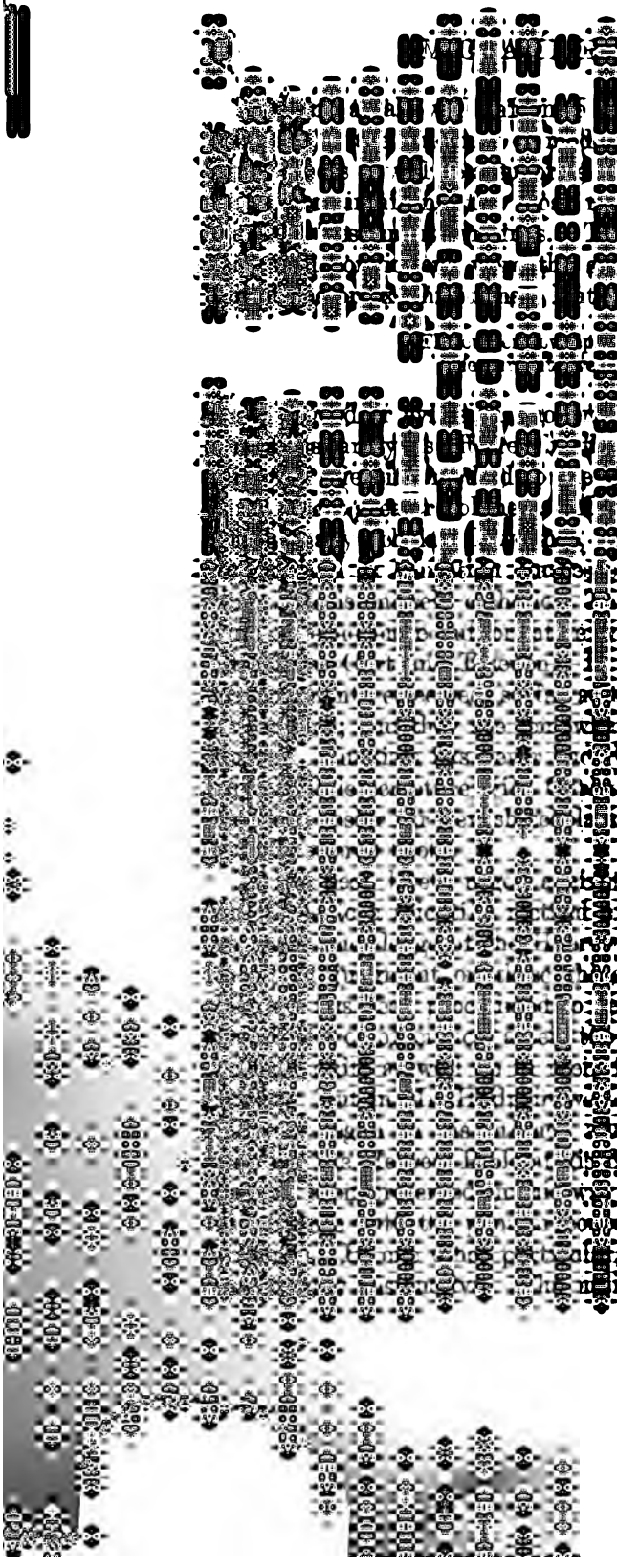
THE HISTORICAL POETRY OF THE ANCIENT HEBREWS

For a number of years following the war Mr. Heilprin found little time for contributions to the *Nation*. He was engaged in his arduous labor of revising Appleton's Cyclopædia, and after the completion of that task he at last found it possible to carry out a plan that had long occupied his thought. *The Historical Poetry of the Ancient Hebrews*, embodying his life-long studies in Biblical literature, was the fruit of the comparative leisure of the next years. It is not my purpose to speak at length of a work which has made a name for itself, but it will not be inappropriate to reprint from the columns of the *Nation* the two critical notices, from a competent hand, of Mr. Heilprin's volumes. They appeared in the issues of July 24, 1879, and July 22, 1880.

Heilprin's Hebrew Poetry

I

Those who are best able to judge of Mr. Heilprin's scholarship and general force of mind will not go far in these pages without being convinced that he is completely at home in this department of research. Everywhere there is unmistakable evidence that he is speaking out of the fulness of his knowledge. His name has not, we believe, appeared upon the title-page of any book before, though he has already reached "the arm-chair period of life." So much the better; we have here the ripe result of a whole lifetime's careful and enthusiastic study and investigation. But Mr. Heilprin has long been known among our metropolitan scholars as one of the most learned of their company; a man whose encyclopædic knowledge, especially in the field of history, has amply provided him with that historical sense without which studies like the present are apt to be almost entirely vain.



ILPRIN

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that the scientific study of the Bible is inconsistent with the most tender reverence for its contents or with their persistent fascination. But the reverence of Mr. Heilprin for the subject-matter of his criticism could hardly be surpassed, and that it has not lost its power to interest and charm, his book itself is ample evidence, which will be reinforced by the experience of every intelligent reader of its too brief contents.

The present volume is only the first of a series which must inevitably contain two or three more to bring it to a natural completion. The poetry of the prophets, as yet untouched, is almost exclusively historical, and, treated with as much amplitude as the fragments to which the present volume is devoted, will demand no inconsiderable amount of space. Mr. Heilprin plunges immediately into his subject without any preface or introduction, and leaves the reader to discover his method from his book. The first section is, therefore, somewhat misleading. It treats of the address of Lamech to his two wives, Adah and Zillah. The passage containing this address being the first poetical passage in the Bible, the reader is led to expect that the poetical passages are to be taken up in the order of their occurrence. But Mr. Heilprin's method proves to be quite different. He takes the accepted order of Hebrew history and brings to its illustration the poetical passages that are concerned with it wherever they occur. Thus it happens that his second section deals with Psalm cv.: "It is, if not surprising, worthy of notice," Mr. Heilprin remarks, "that not a single piece of Hebrew poetry has been preserved in the Scriptures of which the subject is either Abraham, Isaac, Jacob, or Joseph, all of whom are heroes of extensive prose narratives, and all of whom were revered by the Hebrews as national patriarchs." The author of Psalm cv., however, does late and scanty justice to these heroes by introducing them into a poetical summary of the history of Israel from the earliest times down to those subsequent to the captivity in Babylon. This summary includes the two following psalms. The three, argues Mr. Heilprin, belong to the same period. Mr. Heilprin's translation of the first is full of force and beauty, and is a new evidence for the necessity of a revised translation of the Bible, if we really care to know the thoughts expressed in the original. It has been acutely argued

that the religion of modern Protestantism has been founded upon the King James translation, not on the original, and that to change the translation is to change the religion of the English-Protestant world. It may be so, but the argument comes with an ill grace from those who accept the original Hebrew as peculiarly the word of God.

By way of introduction to the so-called "Blessing of Jacob," Mr. Heilprin discusses at some length the patriarchal legends, quoting with undisguised approval the monograph of A. Bernstein, the central idea of which is that there were originally three centres of patriarchal legend, and that the ultimate shape which the different legends assumed resulted from the clumsy harmonizing of much that was antagonistic and incongruous. The different centres corresponded to the tribes Judah, Simeon, and Ephraim, and were deeply colored by their rivalries and hostilities. We cannot follow out this scheme into its details, but many of them are exceedingly interesting. Abraham was the favorite patriarch of Judah, Isaac of Simeon, and Jacob of Ephraim. The story of Judah and Tamar, according to Bernstein, was originally a lampoon on David and his house. The marriage of Judah with a Canaanitess corresponds to David's with the Hittitess, Uriah's wife. There are other points of correspondence. David's line is made to originate in the disgraceful connection of Judah with Tamar. But such was the *naïveté* of the harmonists that this lampoon was ultimately included in the Davidic legend as if it were the simple truth.

"The Blessing of Jacob," to which we are introduced by this discussion, is regarded by Mr. Heilprin, who in this instance also has the acute criticism of Bernstein to support him, as an Ephraimic retrospect of a time subsequent to the disruption of the kingdom. To this disruption is referred the famous text, "Until Shiloh come," commonly spoken of as a Messianic prophecy. Mr. Heilprin translates "Until he [Judah, the tribe] come to Shiloh and there is a gathering of tribes around him." This, of course, makes it a prophecy *post eventum*.

Mr. Heilprin's translation of Miriam's Red Sea song is full of spirit. He is disposed to consider it of later origin than the corresponding narrative, finding allusions in it to the temple. But some of its verses have "the ring of great antiquity." The

story of Balak and Balaam given in the Book of Numbers has long been one of the most fascinating for the critics, conservative and radical alike. It is as fascinating for Mr. Heilprin as for any of his predecessors. The episode of the ass and the angel he considers an interpolation of a later writer. The Balaam of this story is a noble figure; but the Hebrews had another Balaam in their legends who was very different — a vulgar soothsayer. Which of these legends is the older it is difficult to determine. The latter has the advantage of being embedded in a dry historical narrative. Mr. Heilprin apparently sympathizes with the almost startling suggestion of Seinecke that the Macedonian power was already in the ascendant when the concluding lines of this superb fragment of Scripture were composed.

"The Blessing of Moses" (Deut. xxxiii.) is carefully compared with "The Blessing of Jacob." It breathes a much more amicable and gentle spirit, and belongs to a later period, when the animosities of Judah and Israel were somewhat softened. The omission of Simeon from this blessing is a notable fact, on which the commentators have spent, not to say wasted, an immense amount of ingenuity. Mr. Heilprin, following Graetz, who in his turn follows the Talmudist Rabbi Eliezer, argues that we should read, "Hear, O Jehovah, Simeon's voice," and not "Judah's," and gives plausible reasons for such a change.

"The Song of Deborah," Kuenen's readers will remember, is regarded by him as a document more nearly contemporary with the event recorded than almost any other in the early Hebrew history. But Mr. Heilprin, while admiring this splendid fragment as heartily as possible, is inclined to assign it to a much later period than that of the Judges, and to be exceedingly doubtful of its historic value. He discovers Aramaisms in it which point to the Babylonian period of Hebrew literature. Instead of a spontaneous outburst, we have here a finished work of art. The victory of Thothmes III. on the battle-field of Megiddo is perhaps the most considerable element of fact in this fascinating mixture of Israelitish and Egyptian war reminiscences.

In treating the legend of Samson Mr. Heilprin does not

...ations of Goldziher and Oort ...many others, regard the story ... a sort of Hebrew Hercules. ...oses, some Danite hero of her... ...furnished a point of attach... ...easily determined. There can ...going the length of Goldziher, ...ad strong attractions for each ...r heroes were often borrowed ...of great popular renown, and ...was equally natural.

...opens up to Mr. Heilprin the ...ter, and his relation to the ex... ...tament which has always been ...onclusions at which he arrives ...s literary claims. Of the sev... ...id in the Old Testament Ewald ...en only. Professor Robertson ...itannica," contends for the un... ...r. Heilprin prefers to either of ...and Oort, to the effect that no... ...e workmanship of David, and ...ust go the way of all the rest ...rounds on which he bases this ...generally satisfactory, but they ...ul consideration.

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Mr. Heilprin's second volume ...es of Old Testament poetry are ...olume, which appeared about a ...d by us at the time of its ap-

pearance with considerable fulness. The favorable opinion which we then expressed of the merits of Mr. Heilprin's work has since been supported by the opinion of many competent critics. Especially noteworthy is the welcome accorded to the book by Dr. Abram Kuenen, the acknowledged head of the Dutch school of Biblical criticism, whose "Religion of Israel" and "Prophets and Prophecy in Israel" are the most important Biblical studies that have appeared since Strauss's "Leben Jesu," and the most worthy of that so lightly-used designation, "epoch-making books." Mr. Heilprin's desire to advance certain critical ideas rather than his own reputation for novelty or originality, led him in his former volume to fall back in many instances on the expressions of other scholars even when his own enquiries had anticipated their results; and this modesty on his part argued to some of his more careless readers that his book was largely a compilation of the results of other critics. The more careful could not have been so mistaken. At every turn there was for such the evidence of a mind as easily at home in Old Testament studies, their broader aspects and their nicest verbal intricacies, as any of the most famous critics of our time. Dr. Kuenen has amply recognized this fact in his review of Mr. Heilprin's first volume. Mr. Heilprin is, in fact, so little servile, so freely speculative, so daringly original, that not the least of his merits is his ability to refrain from the suggestion of theories which have not yet arrived at definite scientific confirmation. In the second volume we have the same unconventional treatment of the general subject as in the first, the same willingness to subject the most cherished theories to the tests of scientific study, and, consequently, the same wide departure from those opinions of the Old Testament literature which are commonly held among us. Even the translations sound the knell of many a fond illusion, resolving words that have long been used as theological weapons into the nothingness of total misinterpretation; and this, too, without the appearance anywhere of any dogmatic impulse whatsoever. Intent only on a correct translation of the ancient Hebrew, Mr. Heilprin never shows the least desire to rob a theologian of some cherished text.

The translations in this volume engross much more space and

deal with texts of much greater interest than in the former. The gain in intelligibility over our common version is no greater than the well-instructed would anticipate, but to the uninstructed it must seem immense, and we can imagine the mingled feelings of distress and pleasure with which the average Bible-reader would find the cabalistic phrases which he has read so often without attaching to them any definite meaning suddenly becoming apprehensible to his understanding. But with all this there is not much if any loss of poetic charm. This is the more remarkable to an English reader, because Mr. Heilprin was not to the manner born of our common version, and apparently he has made no attempt, as many of our translators very properly do, to conform to this as nearly as possible. His success is simply that of a man who has a nice feeling for words, who likes them homely and strong, and knows that only such are a fit vehicle for the transmission of the ideas and sentiments of ancient Hebrew poetry.

The present volume begins with David, and, like the former, follows the chronological order of events and not that of the literary matter. Having shown already how little reason there is to suspect David of literary authorship, it is now shown that he is only incidentally the subject of his nation's poetry. The most considerable mention of him is in Psalms lxxxix. and cxxxii., and here it is the late echo of popular traditions already formed, and is entirely at variance with the comparatively trustworthy accounts of the historic books. Solomon, who figures so magnificently in the prose histories, "besides figuring as an author in spurious superscriptions," is not honored by either prophet or psalmist with so much as the briefest mention. To the "Song of Songs" Mr. Heilprin accords no historical relation to Solomon, either subjective or objective; hence it does not here fall within the scope of his criticism. Yet in one of his longer notes he is led to declare with emphasis in favor of the theory, defended by Graetz, which considers the "Song" a product of the age of the Ptolemies.

The twenty-third section of Mr. Heilprin's studies is one of the most interesting in his series, and reveals as well as any the acuteness of his critical perceptions. It deals with the successors of Zimri, Omri, and Ahab, the objects of the prophet

Micah's severest animadversion in the book of prophecy ascribed to him. In the Book of Kings elaborate mention is made of Ahab; and a prophet Micaiah, the son of Imlah, figures conspicuously. The narrative has many points of contact with the prophecies of Micah of Moresheth. These are variously explained. Mr. Heilprin, accepting as the most plausible hypothesis that Micah introduced into his book fragments of the older prophet, applying them to the events of his own time, rescues a number of passages which he conceives to be of the more ancient date, and assigns to them a definite historical importance. Hardly less interesting here than the critical result is the side-light which it throws upon the literary methods of the prophetic period. Evidently the right of property in ideas was then but little understood, and there were no conceptions corresponding to the words plagiarism and forgery.

The next following section introduces us to the famous Moabite stone discovered at Diban in 1868. Mr. Heilprin gives a translation of so much of the decipherment as the ablest expounders — Schlottmann, Nöldeke, Kaempf, and M. A. Levy — are fully agreed upon, following it with an account from Kings of the subsequent course of events. The poetic fragment corresponding to this is found in Isaiah xv. and xvi., which have been fully established to be not Isaiah's, abounding as they do in peculiar and archaic forms of expression. Nothing else in the Old Testament, says Knobel, can be the production of the same author.

The next five sections of Mr. Heilprin's book, from the twenty-fifth to the thirtieth, deal exclusively with the prophecies of Amos of Tekoa, who, about 800 B. C., came from Judah to preach righteousness in Israel.

"We can almost image to ourselves," he says, "the plain, poor man from Tekoa — for he was one of the shepherds of that little town who tended their flocks on the borders of the wilderness of Judah — standing before a concourse of people at the public place of Beth-El or Samaria, reading from a scroll brought with him the last of a string of direful prophetic utterances, and suddenly breaking off at the fresh remembrance of shocking experiences, and wildly pouring forth against his hearers accusations, reproaches, and imprecations. It was heartless oppression of the poor by the rich and

[illegible] peless licentiousness fed by extor- [illegible] outburst of wrath."

[illegible] introduced is full of energy. [illegible]t into it as well as his head, [illegible] in primitive Oriental fashion. [illegible]ith others bearing on the his- [illegible]e comes in the twenty-seventh [illegible]ia, the nation in which Amos [illegible]l. The black obelisk inscrip- [illegible]imrud is parallel with Amos [illegible]he monolith inscription found [illegible]bull inscription"; or, rather, [illegible]e the state of things which was [illegible], and which he might well an- [illegible] three chapters of Amos have a [illegible]guishes them sharply from the [illegible]ese chapters Mr. Heilprin as- [illegible]ater than the preceding. The [illegible] are of a much more optimistic [illegible] the body of the work, bear a [illegible]cluding passages of Joel and [illegible]y added, Mr. Heilprin thinks, [illegible] the minor prophets in order *to* [illegible]ions of lasting prosperity and

[illegible]acteristics of Amos and of the [illegible] the translations and criticisms [illegible]oduced by an exposition of the [illegible] 6, in which the actual Amos [illegible]on as different from him as the [illegible]enerally are different from the [illegible] preserved for our instruction. [illegible] and miraculously precise reve- [illegible]aple of the narrative. In the [illegible]nspicuous thing is moral ex- [illegible]al relationships of cause and [illegible]t appear that the prophets of [illegible]d personages than those of the

canonical prophetic books. To Mr. Heilprin it does not so appear. What impresses him in Amos and the rest of his great company is a certain moral grandeur. This he fully recognizes and to this he pays due reverence, and the concluding passages of his treatment of Amos rise with his honest enthusiasm to a height of eloquent expression which, if not anticipated in a discussion naturally somewhat dry and bare, is none the less welcome, certain as we are of its unqualified sincerity.

The thirtieth and concluding section of the present volume deals exclusively with the book of the prophet Hosea. An interesting problem meets us at the very threshold of this book in the astonishing parabolic utterances with which it begins. That these utterances are parabolic has strangely enough been doubted by a critic so reasonable in his conclusions generally as Dean Stanley. To suppose them narrations of literal fact is to credit Hosea with carrying symbolic action to a disgusting extent. The conclusion of Mr. Heilprin, who is by no means solitary here, that these utterances are purely parabolical, is a conclusion as much more pleasing as it is more rational than the other. The differences between Amos and Hosea are clearly indicated. In the latter with an equal earnestness there is an added strain of tenderness. The translations from Hosea are copious; the critical remarks are few and still sufficient. The translations are very spirited, and make many dark sayings of our common version clear as day. Some fifty pages of critical and explanatory notes at the end of the book appeal to those who are versed in the niceties of scholarship rather than to the general reader, but they will be appreciated by those for whom they are intended. We are obliged to lament, as in the former volume, the absence of any index or table of contents, an absence the more noticeable as in other particulars the bookmaker has seconded the author in the most creditable and even luxurious manner. The concluding volume will, no doubt, repair this deficiency.

Mr. Heilprin's *Historical Poetry* attracted the attention of the learned, both here and abroad. Professor Kuenen, in speaking of the work in the Leyden *Theologisch Tijdschrift*, hailed the author as an intellectual kinsman ("In Michael Heilprin

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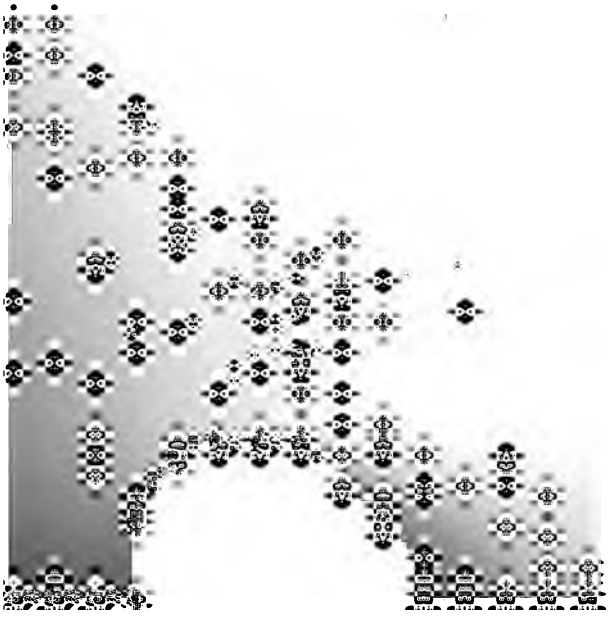


IV

AN ESSAY ON FOREIGN NAMES

As a direct result of his editorial revision of the American Cyclopædia, Mr. Heilprin published in the *Nation*, October 18 and 25 and November 1, 1877, three articles on the transliteration of foreign names, a subject of considerable interest to English writers dealing with foreign countries. The value of these articles to the newspaper world in particular was generally recognized, and they have to this day served as a guide to more than one perplexed editor. The essay is reproduced in its entirety.

I

It was foolish on the part of a certain Englishman to express his astonishment at the fluency with which little children speak French in Paris. But it would be unjust to laugh at a foreigner admiring the consummate ease with which boys and girls of ten or twelve years read and write English in London or Boston. He may never have heard of children's spending hundreds, nay thousands, of hours in learning to spell. Persons whose native language, be it Germanic or Slavic, Semitic or Finnic, possesses an orthography based on a more or less strictly uniform representation by written signs of the sounds produced in speaking, may behold with wonderment how easily native readers of English recognize the changing value or the valuelessness of their *w*, *o*, *g*, or *h*, in such words as *how* and *hew* and *who*, *wrought* and *taught* and *draught*, *brow* and *brought* and *borough*; how the better-instructed distinguish in reading between the Thames that traverses London and the Thames that flows past New London, and discriminatingly give the syllable *Beau* the sound of *bō* in *Beauregard*, of *bū* in *Beaufort*, and of *bē* in *Beauchamp*; how some do not forget to read "Ciren-

cester" *sisester,* and "Pontefract" *pomfret,* and even know how to pronounce the name of Sir Patrick McChombaich de Colquhoun, who lately told us all about Osman Pasha's origin and appearance; and how nimbly, in reproducing sounds on paper, almost all choose, according to the meaning, between *you* and *yew, hew* and *Hugh, so* and *sow* and *sew.*

And yet, in spite of all the irregularities of English spelling, which are the stumbling-block of the foreign student of the language, and the torment of many an English-speaking learner, Matthew Arnold is probably right when he tells us in his late report as one of her Majesty's Inspectors of Schools, that the British nation will not be induced to take to writing, "Leed uz not into temtaishon." Nor will the American nation very soon either, though a grand innovation of this character might be a worthy object of ambition for a young and progressive republic. Anglo-Saxons on both sides of the Atlantic are generally taught to read and write correctly, though at an enormous sacrifice of time, and they are either satisfied with their early-acquired knowledge, or gradually improve it. With slight exceptions all English words are written and printed in one form by all educated people, and when that form is especially hard to remember, cheap dictionaries, which can everywhere be found, help the doubting writer; the author and journalist often rely upon the tried experience of their compositor and proof-reader.

This knowledge, however, and the common aids to it, are with Anglo-Saxons limited to what is generally taught, spoken of, and read, and but a little more. The common stock of the English vocabulary, scientific terms, Biblical names, names conspicuous in history, geography, and literature, can all be learned in their correct form, if there is no lack of will, opportunity, and time. For rarer foreign names bulky dictionaries of biography and geography or voluminous cyclopædias are required, and the incompleteness of all of them, and the inexactness and inconsistency of most of them, are soon discovered. Then, entirely new names appear from day to day in the newspapers, and the reader is bewildered by the variety of forms in which they appear, not only in different publications but often in the same. What causes the confusion is plain: one English cor-

respondent adopts the spelling of his German paper or informant; another writes the name as he finds it in French; still another tries a transliteration of his own; and most editors have too little knowledge and time to examine and rectify. Here the barbarism of the English indifference to the value of letters shows itself in its fulness. Readers look at the names without pronouncing them, and writers spell at random.

Here is an example of present occurrence: All our newspapers report the movements of "Chefket" Pasha. This name once figured in the Bulgarian massacres. It is now connected with the defense of Plevna. It will probably be remembered in history, it matters not how ingloriously. But how have we to pronounce it? According to Turkish rules? Why, the Turks use the Arabic alphabet, and not the Roman. Is the *ch* to be pronounced as in English *chaff*? Our newspapers, in their war reports, constantly use *tch* as an equivalent for this sound in Turkish or Russian names, such as Rustchuk, Tultcha, Tcherkasski, or Gortchakoff. Is the *ch* the equivalent of our *sh*, as in the French *chef*, of a guttural *kh* as in the German forms Chosrew, Churschid, etc., or of *k*, as in our rendering of classical or Biblical names, such as Chephren, Cheops, Chephirah, or Chemosh? To recapitulate, is the Pasha's name Tchefket, Shefket, Khefket, or Kefket? There is absolutely nothing in the rules and ways of English journals, British or American, to indicate it. The confusion arises from the indiscriminate use of foreign combinations of letters, though they may be to us indefinite, meaningless, or barbarous, and though plain and distinct English equivalents may be at hand.

Of course, journals of the better class would soon adopt some tolerably rational rules for spelling foreign names, if such were observed by authors of travels and history, translators of foreign works, map-makers, and especially by writers for cyclopædias. But this is far from being generally the case. To give an instance: Suppose a journalist interested in the doings and brewings of that bellicose little state, Servia, looks for precise information in Ranke's history of that country, as republished in English in the Bohn collection. The names of the author and the publisher are certainly both good. He relies on the correctness of the geographical and historical names and terms

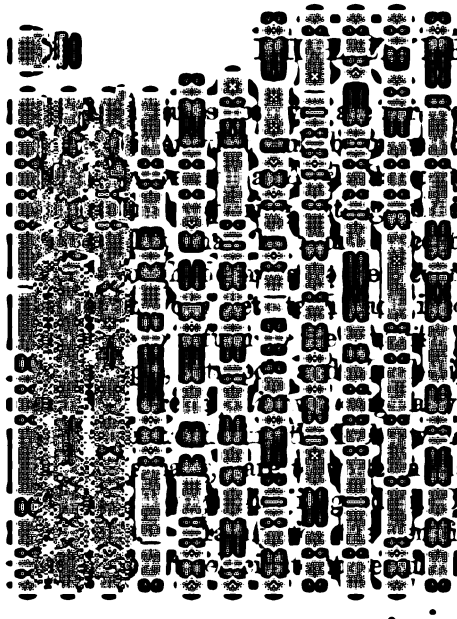
contained in the book, and on occasion reproduces them as he finds them, thus: *Schabaz* (p. 72), *Svornik* (74), *Kragujevas* (77), *Uschize* (89), *Nisch* (98), *Poscharevas* (127) — all German names of places well known to English gazetteers as Shabatz, Zvornik, Kraguyevatz, Uzhitze, Nish, and Pozharevatz — *Miloesch* (163), *Scheik* (237); and he may not recoil from copying *Dschemaat* and *Kmetschalies* (69), forgetting, as Bohn's translator did, that the *dsch* of Ranke's original is our short and plain *j*. Or suppose our journalist to be anxious to obtain fresh information about the Caucasus, the easternmost border of the present theatre of war, and to look for it in the article assigned to it in the new "Encyclopædia Britannica" (vol. v., 1876). He reads of "Dych" Tau, 16,925 feet high, and asks himself, Is the name of that lofty mountain Dytch, Dysh, or Dykh? There is no presumption in favor of the common English pronunciation as in *rich* or *which*, for he finds in the same article "*Tch*erek," "*Tch*egen," etc., and there is nobody to tell whether the writer copied an English, French, or German traveller. A similar question arises when he reads of the river "Lachwa"; is it Latch-, Lash-, or Lakh-? The following *w*, apparently English, is no evidence in favor of *ch*, for there is "Krest*owaja*" near by, a Russian adjective which ought to have, but has not, been converted into Krestovaya. And there he finds also "*Schach* Dagh," and "Uru*ch*," and "*Tschech*nia, or the country of the *Tchetch*ens" — which shows that there is no difference *in the same name* between *ch*, *tch*, and *tsch* — and also "*Sch*umi" for Shumi and "*Dsch*ufa" for Jufa.

He turns to his English atlases. They may not be better, though some are, than the two before us. We open the map of Russia, which contains the Caucasus. The first word that strikes us in one atlas, published in England, is "Vladi-Caucas" — half Russian, half what? — for Vladikavkaz. We glance at the other, published in America, and find north of that locality to the left *Cubane*, and to the right *Couma*, perfect French names of the rivers which English geographers call Kuban and Kuma. We turn to a higher latitude, and find in the former atlas, in a line, "Jaroslav," "Jurievitz," and "Jaransk," slightly imperfect German names of the towns which Russians and English call Yaroslav or Yaroslavl, Yurie-

vetz, and Yaransk, and in the latter, in the same line continued, "Ourjoum," "Doubrovsko," and "Koungour," which is all French again, while extra-English "Vetl*oo*ga," near "Yaransk," "L*oo*ki," etc., remind us that our map is not bodily taken from a French atlas. Shall we speak of war-maps? The latest of the great London *Times* is before us. We look for the now memorable Yantra River and its chief affluent, the Zlatar, and find them marked "Jantra," "Slatar," after German maps. A prominent American daily, in maps and text, for months printed "Ardaban" instead of Ardahan, though its rivals and English models had the correct name. And yet, what should we say on constantly finding in European accounts of our Virginian campaigns instead of Rappahannock "Rappabannock"?

And here is one of the latest books of travel and statistics in English, Baker's "Turkey" (1877). Its contents everywhere display the author's great familiarity with the localities and things described, yet he misspells names and terms in the regular polyglot way of English tourists and guides. His work, though the result of close observation, may have been somewhat hastily brought out as a companion book to Wallace's "Russia," which preceded it only by a few months — and, by the bye, is generally correct in the minutest particulars — but that circumstance cannot serve to excuse such un-English spellings, considering the real names, as "Milos*ch*" (repeated over and over again), "*J*antra," "*J*enikoi," "Vo*j*utza," "Karlo*w*a," "*Dzh*ami," "*Dj*umaa," and "Jene*dsch*e." His transliteration of Turkish vowels is equally careless and capricious. In his appendix, "Glossary of a few Turkish Terms, etc.," we find "d*u*m*u*m," "g*u*mr*u*k," "m*u*fti," "m*u*sselim," and "wokal*u*t" side by side with "Anad*oo*loo," "k*oo*rban," and "timett*oo*," as well as with "m*ou*ktar," "tap*ou*," and "vac*ou*f."

During a six years' editorial connection with two American cyclopædic publications, embracing twenty volumes, it has been the writer's duty to apply a strict system of rational orthography, uniform in respect to the spelling of foreign names and words. That system is neither too elaborate nor too learnedly profound for common use, nor does it require the application of signs not employed in printing popular English works. Combining uniformity with regard for more or less uncontested



EILPRIN

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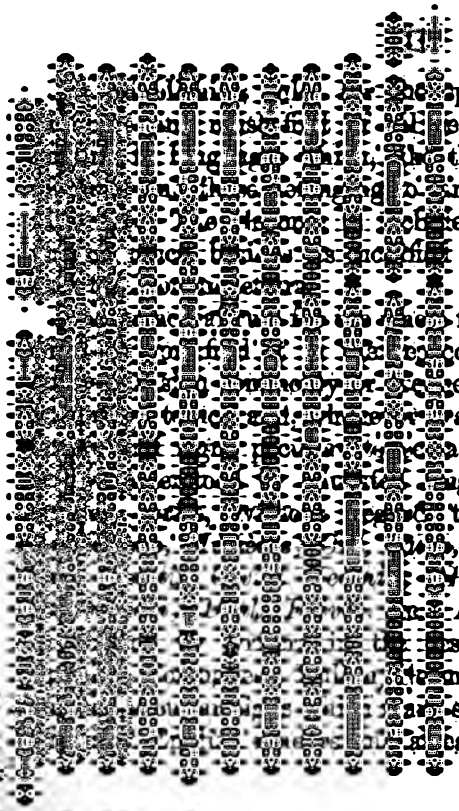

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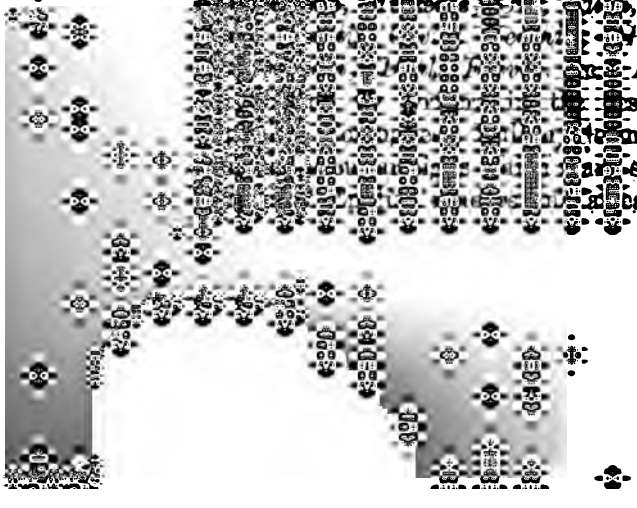


literature. To write, according to the sound, *Tchartoryski*, instead of Czartoryski, would be as absurd as writing *Tchaldeenee* for Cialdini. On the other hand, it would be equally useless and troublesome to write, according to the strict Polish usage, *Częstochowa*, instead of the common substitute Czenstochowa, or *Kościuszko*, with a softened *s*; as the value of *ę* or *ś* is hardly known to one out of ten thousand English readers. The mark above the *s* may safely be ignored, and *en* is a good substitute for *ę*. Such is also *ö* for the Danish *ø*, as in *Jørgen*, and for the Hungarian *ő*, as in *Petőfi*; and we justly write *Abo*, instead of Åbo, as the Swedes have it, and call the great rivers of Sweden Tornea, Lulea, Pitea, etc., always ignoring the circular mark above the *a*, although it changes the sound. Of course, all this refers only to the general use of forms, when we apply our own names to men or places; when, in an explanatory way, the original rendering is to be fully stated, the strictest reproduction is required.

An important exception to the general rule is this: Whenever there is a well-established English form for a foreign name, that is to be preferred to the stricter national form. Hardly anybody writes *Venezia* for Venice, *Napoli* for Naples, *Kjöbenhavn* for Copenhagen, *Warszawa* for Warsaw, *Trento* or *Trient* for Trent, *Praha* for Prague, or *Wien* for Vienna; few write *Köln* for Cologne, *München* for Munich, or *Livorno* for Leghorn; and the best English usage still prefers *Lyons, Marseilles, Brussels, Ghent, Mentz, Leipsic, Cleves,* and *Treves,* to the national names *Lyon, Marseille, Bruxelles, Gand, Mainz, Leipzig, Kleve,* and *Trier*. The time is surely not far off when writers of eminence will inaugurate sounder literary usages, but it will be the task of new Macaulays, Carlyles, and Prescotts to lead in the reform; writers for cyclopædias, gazetteers, and journals can do no better than slowly follow.

In the same way in which English history speaks of the treaty of Ghent, of the battle of Leipsic, of the council of Trent, or of the capture of Warsaw, giving preference to its own established forms above similar and more correct foreign ones, it has also arbitrarily decided between the rival claims of nationalities as to names of places, and there can be no appeal from its decision. We must still state, following our German guides in

history, that Wallenstein was assassinated at Eger in Bohemia, though we have learned that the Bohemian name of that town is Cheb; that Maria Theresa appeared before the Hungarian diet at Presburg, though Hungarians correctly tell us that their diet was then held at Pozsony; that the capital of Austrian Poland is Lemberg, though the Poles call it Lwów, and the capital of Croatia, Agram, though called Zagreb by the Croats. This historical usage, however, must be confined within narrow limits. Wherever the proper national form is similar to the historical, and the latter not exclusively used, the former is to be selected. Thus, *Poltava* is to be preferred to *Pultowa, Kalisz* to *Kalisch, Breisach* to *Brisach, Mühlhausen* to *Mulhouse, Basel* to *Basle* or *Bâle, Bern* to *Berne, Zürich* to *Zurich,* while, on the other hand, *Komárom* is not to be substituted for *Comorn, Torun* for *Thorn,* or *Gdansk* for *Dantzic.* As a rule it can be stated that the English usage decidedly prefers the German names to the Polish in Posen and other Prussian provinces, and to the Czechic in Bohemia and Moravia, but more rarely to the Magyar and Slavic in the countries of the Hungarian crown; the Polish, with few exceptions, to the German or Russian in the so-called Kingdom of Poland and in Galicia; the Russian always to the Polish in Lithuania, Volhynia, Podolia, and Ukraine; and the French sometimes to the German on or near the Rhine. Such exceptional French names, however, as *Aix-la-Chapelle* for *Aachen, Coire* for *Chur, Lucerne* for *Luzern,* are becoming rare, and *Soleure* may now safely be given up for *Solothurn, Deux-Ponts* for *Zweibrücken,* and *Juliers* for *Jülich. Mayence* is probably as often used as *Mentz,* and *Mainz* may be equally good; but the writer must make his choice, in this as in similar cases, and cling to it, refraining from giving us a sing-song like this (in Murray's "Continent"): "Mayence, the *Moguntiacum* of the Romans. . . . The most remarkable objects in Mainz, . . . St. Boniface. . . . first archbishop of Mayence. . . . The Elector of Mainz. . . . Its tower commands the best view of Mayence. . . . Mainz was the cradle of the art of printing. . . . Mayence carries on a great trade. A bridge . . . unites Mainz to Cassel, or Castel. . . . Station in Mayence," etc.

Classical Greek names must be exceptionally grouped with

those originally written in Roman letters. The English have taken them all not from the original texts but from Latin transcribers, and only such independent specialists as Grote can afford to call Hellenic men and places by their proper Hellenic names, such as Alkibiadês, Kleisthenês, Kyrênê, and Pheidôn, for which English writers have learned from Cicero, Nepos, and other Romans to substitute Alcibiades, Clisthenes, Cyrene, and Phidon. Those ancient Persian, Median, Lydian, and Egyptian names, too, which we have learned from the Greeks and Romans, must remain in popular works as the Latin texts have them: Cyrus, Cyaxares, Crœsus, Amasis, etc. The Latin terminations are often dropped or altered, and the popular English names which arise from the change are universally adopted. Thus, even Grote knows only King Philip, Athens, and Thebes, not Philippus, Athenæ, or Thebæ. Where our knowledge is derived from sources discovered in modern times, such as hieroglyphs or cuneiform inscriptions, strict transliteration is required. We then say, with George Rawlinson, Sheshonk, Osorkon, etc., or, after Brugsch, Sebek-hotep, Shasu, etc., omitting the latter's dot under the *h* in "hotep," as proper only in scholarly dissertations, and substituting in "Shasu" for his *š* the plain English equivalent *sh*. Our *kh* and *k* are good equivalents for his *χ* and *q*. The Egyptologist's or Assyriologist's way of spelling must, of course, be closely studied before transliteration is attempted. The *ch* alone, as found in various applications in Brugsch, Ebers, Rougé, Chabas, Mariette, and others, has caused a great deal of confusion in English books. Hence it probably is, *e. g.*, that the classical Cheops appears as Shufu in Rawlinson's 'Manual of Ancient History' and in the 'American Cyclopædia,' and as Khufu in the English edition of Lenormant's 'Ancient History of the East,' in the new 'Britannica,' and in the 'Condensed American Cyclopædia,' which, on better information, dropped the form used by its predecessor. Philip Smith, in his 'Ancient History of the East,' avoiding a difficulty, writes *Chufu*. But here again the question arises, How is the word to be pronounced? Was the name of the pyramid-builder Tchufu, Shufu, Khufu, or Kufu?

Corresponding to the difference between classical and modern

Greek names is the difference between Biblical and post-Biblical Hebrew names. For the Biblical, which the English have not taken from the Hebrew or Greek originals, but from the Vulgate and the patristic writers, we have a plain rule: They are to be written as we find them in the English Bible. To call (in popular writing, we repeat) the great Hebrew prophets by their original names, Mosheh, Yeshayahu, and Yirmeyahu, instead of Moses, Isaiah, and Jeremiah, or the first and last Evangelists Matthæus or Mattithyahu and Yohannes or Yohanan, would not be quite as absurd as to speak of Yitzhak Newton or Yaakob Astor, but, to say the least, unnecessarily strange. The names of all post-Biblical Jews, too, if derived from the Scriptures, must retain their Anglicized form, and it matters not whether the bearers of them were Talmudists, mediæval rabbis, or modern celebrities. We thus speak alike of Moses (not Mosheh) Maimonides and Moses Mendelssohn, of Solomon (not Shelomoh) ben Gabirol and Solomon Judah Rappaport, of Judah (not Yehudah) the Holy and Judah Touro. On the other hand, a strict transliteration is demanded of rabbinical and other more or less pure Hebrew names which are not taken from Scriptures, and therefore have no popular English forms. And in this field, he who writes on Jewish subjects, if he is not himself possessed of sound Hebrew knowledge, will have to look for trustworthy English guides, and examine closely his German or French authorities before adopting their spellings. Unfortunately, careless imitations, even by writers of extensive knowledge, are frequent, and cyclopædias swarm with such names as Na*ch*man, *S*akkai, and *Z*ebi, in which *ch*, *s*, and *z* (all correct in a German authority) improperly stand for the Hebrew letters of which the English equivalents are *h* (or *'h*), *z*, and *tz* (or *ts*).

How far this carelessness is carried may be illustrated by one striking example. Samuel Davidson, "D.D. of the University of Halle, and LL.D., London," has translated Fürst's 'Hebrew and Chaldee Lexicon,' inclusive of his introductory "Contribution to the History of Hebrew Lexicography." In the lexicon proper the translator fortunately followed good English models, such as Robinson's Gesenius, and, deviating from his author, wrote *Rashi, Mishna,* etc., not *Raschi, Mischna.* But for the

ntroductory essay on lexicography he had no English model efore him, and he therefore blindly copied "*Asche*" (for Ashe), "*Haja*" (for Haya or 'Haya), "*Jezira*" (for Yetira), "*Ch*abib" (for Habib), "*Mach*asora" (for Mahazora), "*Zemach*" (for Tzemah), "*Jachja* Abu-*Sakarijja*" (for Yahya Abu-Zakariyya), "Abu *Jusuf* (*Ch*asdai" (for Abu-Yusuf Hasdai), "*Mazliach*" (for Matzliah), etc., etc., and even "*Menachem*," "*Esra*," and "*Noach*" — good Biblical names in German — for Menahem, Ezra, and Noah! Thus, the English translator of a great Hebrew lexicon "to the Old Testament," in copying his elaborately correct German author, sets an example of ignoring both the English Bible and the Hebrew alphabet.

III

To localities and persons belonging to countries more or less directly ruled by the British, as a matter of course, names in English forms or names adopted by the English are to be applied. In most cases the names are fully established by usage, and however strange the spelling may be, it must be adhered to, as long as we submit, in this country, to the observance of such substitution of signs for sounds as *Shawangunk* for Shonggum. Nothing more barbarous will be discovered among the names referring to Canada, Australia, Cape Colony, or any other of the domains of Great Britain. The whole of India, native as well as properly British, with all its history and literature, falls in this category. English consonants and English vowels, in their most common signification, must be made to represent sounds originating in Sanskrit, Pali, Tamil, Telugu, Cingalese, and other languages. And the most customary spellings appear to be the most appropriate, at least until the lately officially introduced forms, deviating from the traditional ones, are adopted by a large number of leading writers on East India topics. However desirable the change from arbitrary ways to rational rules may be, it is yet too early for popular writers on a variety of subjects, who cannot claim the privileges of learned specialists, to write *Kashmír, Rájputáná, Bhután, Panjáb, Satlej, Narbadá, Láhor, Multán, Húglí, Nasír Uddín, Jalál Uddín, Siráj Ud Daulá*, instead of *Cashmere, Rajpootana, Bootan, Punjaub,*

...itan, Hoogly, Nasireddin or
... Dowlah.

...ndent countries of the East
...nected with that of the British
..., such as Afghanistan, Beloo-
...a, follow the rule applying to
...travellers and merchants, gen-
...mes have been introduced or
...aking people, and the forms
...d and historically traditional.
...abool, Candahar, Ghuzni, Pe-
..., Kelat, Rangoon, Irrawaddy,
... the literarily more accurate
...war, Hindu Kush, Baluches,
...chau, Tchingtchu. Names be-
... excepting a number popularly
... such as Samarcand, Mecca,
... transliteration from the orig-
... all African names, excepting
...d by European nations, whose
... Portuguese, Spanish, English,
... be observed. Well-established
... Tripoli, or Algiers, will nat-

... part of our subject, the rules
... be applied, with the restric-
... belonging to the Russian, Serb,
...ebrew, Arabic, and all other
...et different from the Roman.
... Wallach or Ruman language,
...ch the Roman is changed from
...diar marks. The general rule
... the English, and the vowels in
...their sounds, the former in an
...fy.

... nor the German *tsch,* nor the
...minal consonantal sound con-
...s: *Kamtchatka, Tchad, Tcher-*
...ad, or *Czernavoda,* which are

all liable to mispronunciation. The imitation of German renderings is here productive of the strangest and most unpronounceable combinations. It is bad enough that we have to employ five consonants in order to render one with which the Russian begins the names Shtcherbatoff, Shtchukin: is it not absurd to add two others, which are needed in German, but just deprive our English combination of any meaning, and to write thus: *Schtscherbatoff, Schtschukin?* One of the commonest, and the least pardonable, mistakes in English is the rendering in various forms, by the same writers, of the Russian terminal syllable *vitch,* always corresponding to our *son* in *Johnson, Robertson,* etc. Thus, even so excellent a work as the "Encyclopædia of Chronology," by Woodward and Cates (1872), has "Lermontov . . . Ivan*ovich*," "Dolgorouki . . . Fedor*ovitch*," "Bogdan*owitz* . . . Fedor*owicz*," and many similarly contradictory patronymics. In Polish names, like Mickiewicz, Niemcewicz, only *wicz* is correct, that being the Poles' own spelling *in Roman letters.*

Use *j* as the common equivalent of the German *dsch* and Fr. *dj* in Slavic, Asiatic, and African names, writing *Tunja, Eski Juma, Bazarjik, Kainarji, Jiddah, Jebel el-Jowf, Abulfaraj, Jezireh,* and *dj* only between vowels, as in *Dobrudja, Khodja Balkan, Aladja Dagh, Nedjed, Hedjaz,* in order to indicate clearly the shortness of the first vowel. *Kustendje,* however, seems to be too firmly established in English usage to be changed into *Kustenje.* Palgrave, in his "Central and Eastern Arabia," often strangely reverses the rule, writing *Djowf, Djobbah, Hejaz, Nejed.*

In the same class of names *sh* is the equivalent of the Hebrew *shin,* German *sch,* and French *ch.* Write *Shammai, Shemtob, Hashem, Pushkin, Milosh, Shuvaloff, Shumla, Pelishat, Radishevo, Shefket;* not *Schammai,* etc., *Radichevo, Chefket.*

Zh is our best equivalent for the French *j,* for which the Germans in maps and books now frequently use *sh* (or *ž* as they also use *č* for our *tch,* and *š* for *sh*). Write *Nizhni Novgorod, Zhitomir, Voronezh, Derzhavin, Pozharski, Zhukovski;* not *Nijni, Jitomir, Voronej,* as the French write, and after them many English geographers, including A. Keith Johnston.

Tz and *ts* are equally good for the transliteration of the cor-

responding sound in Hebrew, Russian, and other languages; yet we prefer the former, which agrees with the German, in Semitic, Slavic, and other names, such as Tzarphati, Tzana, Vorontzoff, Olonetz, Tzaritzyn, and the now so often mentioned Grivitza, Lovatz, and Vratza, and *ts* in Japanese names, such as Satsuma, Matsumaë, or Butsu, which follow the usage established by the English in Chinese names (Yangtse, Tientsin, Tsinan, etc.). Great caution must be observed in transliterating after German maps, some geographers applying West-Slavic spellings to South-Slavic countries. Thus, Kanitz's latest map of Bulgaria has *Grivica, Lovec, Vraca.*

Y is the general equivalent for the Semitic *yod,* as well as for the German *j,* the copying of which must be strictly avoided. Write *Yarhi, Yomtob, Yakub, Yusuf, Yezid, Yermak, Tchernayeff, Yeni Zaghra, Yeniköi,* not *Jarhi,* etc. Among the few exceptions founded on usage is *Bajazet; Jassy* and *Janina* it is perhaps time to abandon for *Yassy* and *Yanina.* After a consonant in the same syllable *i* is properly substituted, as in *Biela* (for *Byela* = Ger. *Bjela*), and *ai, ei, oi, ui* are used instead of the stricter forms *ay, ey* (= Ger. *aj, ej*), etc., as in *Turtukai, Alexei, Tolstoi, Shuiski.* After *i* the *y,* corresponding to the German *j* in similar positions, is dropped, as in *Dolni Monastyr, Gorni Dubnik, Dolgoruki, Baratynski.*

For a discriminating use of *v* and *w* a few important rules can be established. *W* prevails in Arabic names, such as Moawiyah, Merwan, Walid, Abul-Wefa, Massowah, or Asswan, and *v* is exclusively to be used in Russian, South-Slavic, and Wallach names. The Russian, Serb, Bulgarian, and Wallach contain no such sound or letter as *w* (while the Polish has only the letter, which is equivalent to our *v*). To write, as is but too often done, *Paskewitch, Wasili, Wolhynia, Wladimir,* or *Wologda,* is, therefore, just as improper as to write, in Hebrew or Greek history, *Lewi* for Levi, *Washti* for Vashti, or *Ewagoras* for Evagoras. *Wilna* (derived from the Polish *Wilno*) and *Widdin* are exceptions founded on historical usage. In the terminal syllables of Russian names of places, such as Azov, Tambov, Kozlov, Saratov, Tchernigov, Pskov, Ostrov, Kishinev, Kiev, *ov* and *ev* are properly used where the Russians have the corresponding letters, but pronounce *off, eff,* yet not in the

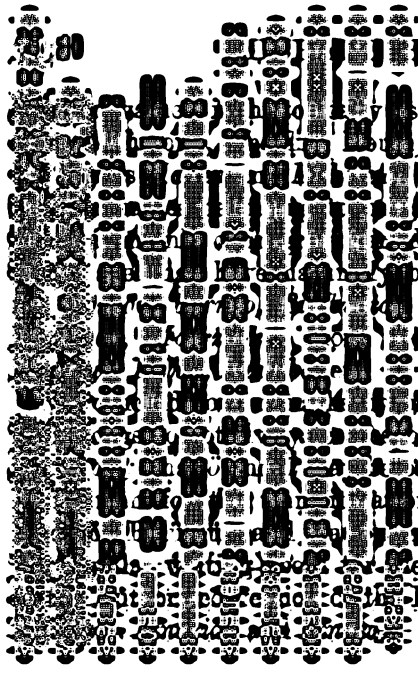
oblique cases. In similarly-ending family names, such as Romanoff, Orloff, Lermontoff, Melikoff, Ignatieff, Skobeleff, and Lazareff, the sound is followed instead of the letter, owing to the habit of the Russians of so signing their own names, as pronounced in the nominative, whenever they use the Roman alphabet in correspondence with Englishmen or Frenchmen. Eugene Schuyler ("Turkistan," 1876) and D. Mackenzie Wallace use in both classes of names *of* and *ef*, which, if consistently done, can, of course, not be objected to.

Kh answers to the full guttural sound (*Ger. ch*, Sp. *j*) in Slavic, Turkish, Tartar, Persian, and other Eastern names, such as Kherson, Kharkov, Astrakhan, Kiakhta, Akhaltzikh, Khiva, Khorasan, Khuzistan, Nakhimoff, Mukhtar, Khurshid; *h* answers to softer gutturals in Eastern tongues, as in the names Hariri (Ger. *Chariri*), Harizi, Hefetz, Ahmed (as in the Biblical Hebron, Heshbon, Hiddekel, Hiram), as well as to the Hebrew *he* (Ger. *h*); *k* (in non-Biblical names) to both the Semitic *kaph* and *koph*, as in Zakkai, Akiba, Koreish, Sakkara. *Ch*, though good in classical and Biblical names, has no place whatever in strict English transliteration.

G is to be used only in its hard acceptation, *j* replacing the soft sound. *Gh* occurs, but rarely, in Eastern names.

Little specification is required as to the vowels. Concurrent or single authoritative spellings by German, Italian, and other Continental writers may generally be followed without hesitation. The French alone of the leading Continental languages forms an exception. Write, therefore, *Selim, Ibrahim, Aziz, Hamid, Kasim, Katif*, and not *Seleem, Ibraheem, Azeez, Hameed*, etc., as Palgrave (in "Arabia") does after Lane (in "Modern Egyptians"), using also his special diacritical marks; *Rashid, Ghadir, Habib, Ahin*, as in Burton's "Unexplored Syria" (1872), not *Rasheed*, etc.; *Ali, Raghib, Ratib, Sherif*, as in McCoan's "Egypt" (1877), not *Alee*, etc.; *Yusuf, Mustapha, Murad, Kurdistan, Turkistan, Stambul, Sukhum, Batum, Erzerum, Urumiah, Burumtchuk*, not *Yoosoof* or *Yousouf*, etc. Such spellings as *Ooroomiah* or *Booroomtchook* are fortunately becoming rare.

Two exceptions, however, must here be stated: The French form *ou* is still frequently preferred to *u* (in its Italian and



tablished names, such as Ha-
Roumelia, though even Gib-
and *oo* is still more generally
of Africa the exploration of
ue to early English travellers,
become popular. Such names
Gaboon, Darfoor, Khartoom,
ent English explorers write

riefly adding that the German
nd to ours — *au, e. g.,* answer-
orrowed from the German and
n of Turkish names, such as
is to be used indiscriminately
e Semitic *aleph* and *ayin,* just
Bible used it in *Adoniram* and

V

COMMENTS ON THE RUSSO-TURKISH WAR

During the Russo-Turkish war of 1877–78 Mr. Heilprin resumed his semi-military contributions to the *Nation,* following from week to week the operations in the field with the same exactitude and fulness of knowledge he had previously shown in his notes on the Franco-German war. He was quite as familiar with localities in the East as in the West of Europe, or with our own battlefields during the Civil War. It has been said, and I believe truly, that he could, down to his last years, locate from memory the position of both the Northern and Southern armies on any given day of the struggle. I select, again at random, a few of these weekly comments on the progress of the Russo-Turkish war.

Nation, October 25, 1877:

"Whether the report from Tiflis that Mukhtar Pasha's total loss in the battle of October 15 was about sixteen thousand, be nearer the truth than that other report from Karajal that he lost eighteen thousand in prisoners alone, it is certain that he suffered a crushing defeat. It may be doubted whether he succeeded in entering the fortifications of Kars with three-fifths of his army, which seems to have consisted of not fully forty thousand men. Great as may have been his folly in so long exposing himself to the sudden attacks of an overwhelming force while he could safely rest under the shelter of his fortress, due credit must be given to the Russian commanders for the skilful execution of the probably long-meditated blow. Of these Gen. Heiman, who carried the Turkish centre, Olya Tepe, seems to have borne the brunt of the fighting. What the ultimate fruits of this great victory will be to the Russians, it is too early to express an opinion upon. Much will depend upon the weather, which may or may not prevent an advance upon Erzerum, and

much also on the amount of supplies accumulated in Kars, which will probably be blockaded, and can hardly count on the speedy approach of a relieving force, though reinforcements for Erzerum are already hurried on from Constantinople, viâ Trebizond, and from Batum. Among the immediate fruits is the evacuation of Russian Armenia by Ismail Pasha, who has recrossed the frontier near Zor, followed by Tergukassoff. Lazareff, who is reported to have turned against him, is too far off and separated by too powerful barriers to intercept his retreat towards Erzerum by the Diadin and Karakilissa road. The Russians' loss in the battle is not yet fully known; in carrying Aladja Dagh they lost fourteen hundred and forty killed and wounded.

Active hostilities have been resumed before Plevna, commencing with a heavy cannonade upon single points of the Turkish positions. This was considered by the Russians as very effective, and the Turks were believed to have more or less fully evacuated the second Grivitza redoubt. On Wednesday, October 17, the Czar, apparently on receiving the congratulations of his staff on the victory of his army in Asia, solemnly declared that he and all the members of the Imperial family would remain with the troops to share in their labors and witness their deeds, adding that, 'if necessary, all Russia will, as once before, take up arms.' The first labors in the new contest for Plevna, however, were assigned, surprisingly enough, not to the Russian troops, so strongly reinforced by the Guard, but to the Rumanian allies. On Friday they assaulted the Grivitza redoubt, but were repulsed before gaining it. They made another attempt, and the three foremost battalions leaped into the trenches, but, the Turks concentrating against them, they were forced to withdraw, after an hour's sanguinary struggle. The total loss, according to the Russian official bulletin, was upwards of nine hundred killed and wounded. About the beginning of the contest the Russians seem to have made a feeble show of fighting on the opposite side, in order to divert Osman Pasha's attention from the real point of attack. The Turks in Plevna are reported to be constructing a new interior line of defences. Their condition as to health and provisions is variously talked of. It is

very bad, if deserters are 'reliable gentlemen'; it is very good, if the London *Standard's* correspondence from Plevna is trustworthy. According to this source 'six thousand provision-carts are now on the road to Plevna' — a piece of information which may possibly compensate the Russians for what they lately suffered through a similar feat of reporting enterprise, for which another *Standard* correspondent has been expelled by them from Rumania. The *Standard's* impartiality is thus vindicated.

Suleiman Pasha, active and daring as he is, has found the Russians too strong and the roads too bad for an aggressive movement on his part, and after reconnoitring the enemy's positions west of the lower Lom, has fallen back on the Rustchuk-Rasgrad line, retaining advanced posts at Kadiköi, north of the Ak (White) Lom, and at Solenik, south of it, between Torlak and Katzelevo. This withdrawal relieves the Russian Crown Prince's forces from a long-sustained and severe pressure, and may dispose him to give up some of his fresh reinforcements for the benefit of the army before Plevna. To judge by movements in the Dobrudja, where Gen. Zimmermann's forces have recently been active all around, detachments of them appearing in the neighborhood of Silistria, around Bazarjik, and near Kavarna, an advance of the Crown Prince against Suleiman, in co-operation with Zimmermann in the rear of the Turkish commander-in-chief's extensive positions, seems to be contemplated, and an attack by the Russians on Solenik on Monday is reported from Shumla. Bad weather and worse roads, however, appear to be a check on all movements requiring days' marching. The Russian communications on both sides of the Danube are described as frightfully wretched. To remedy the evil, according to late reports, the Russians have contracted for the construction of railways which are to connect Simnitza with Giurgevo, and Sistova with Plevna and Tirnova; across the Danube, between Simnitza and Sistova, the cars are to be carried on ferry-boats, on the American plan. Shipka is left out of the scheme. No fighting is reported from that quarter, and none from beyond the Vid. The Prince of Montenegro has dismissed the bulk of his troops 'to sow the crops,' and Milan of Servia continues to negotiate.

Nation, January 3, 1878:

The carrying off of the military bridge at Braila by drifting ice was followed by the destruction of the bridges at Nicopolis and Petroshani, and the removal of those connecting Sistova with Simnitza. All communication between the Russo-Rumanian armies in Bulgaria, both east and west of the Turkish quadrilateral, and their base of supplies in Rumania is thus broken off for a time, which must give an entirely new turn to the operations, or completely suspend them, unless new and speedy changes in the weather render the restoration of a bridge or two possible, or cause the Danube to freeze. The occurrence of the interruption was months ago predicted as probable, and yet it seems to have taken the Russian commanders by surprise, since reports from various quarters represent the camps of the invading armies as inadequately supplied with food for men and beasts, fuel, and other necessaries, even before the interruption of communication has made itself felt. Numbers of Turkish prisoners were left to die of cold at Plevna, it being 'impossible,' as a Russian official despatch stated it, 'to afford them any aid'; scores of prisoners transported to Bucharest, exhausted by want of provisions, were left by their guards to freeze to death on the roadsides, as there were no vehicles to carry them, 'though the absence of wagons was not due to deliberate cruelty.' On the line of the Lom the Moslem inhabitants retire to the woods after burning their villages, the Turkish troops having withdrawn from their advanced positions; and, deprived of his supports, General Todleben, now the virtual commander of the Tzesarevitch's army, will hardly be in a condition to push operations against either Rustchuk or Rasgrad in the middle of winter.

The renewal of hostilities by the Servians and their successful advance in the direction of Sophia must thus be considered no less advantageous to the Russians than was the co-operation of the Rumanians in the Plevna campaign. The southern army of Servia, after the capture of Ak Palanka, occupied Leskovatz,

south of Nissa, and Kurshumlie, west of the latter town; soon after reduced Pirot, on the road to Sophia, taking a number of guns and a few prisoners, and began the investment of Nissa. Turkish troops sent to reinforce Pirot arrived too late, and the garrison of Nissa will probably have to give up all hope of relief from without, since the advance of a Russian force which threatens Sophia must compel the withdrawal of the scattered Ottoman detachments now in Turkish Servia towards that city, or beyond it, if it is to be abandoned. The vanguard of the Russians operating against Ahmed Eyub Pasha has succeeded in occupying some Balkan defiles near Sophia, surprising the Turks by a march over snow-covered mountains and frozen foot-paths, and opening the road to the city. The Turks are expected to evacuate it, and to concentrate for the defense of the passes near Ikhtiman, leading from southwestern Bulgaria into Rumelia. The entrance of the Servians into Bosnia is reported from Belgrade to have been precluded by an effective protest of Austria; but it is only a strenuous resistance of Nissa which may prevent them from invading the region of Prishtina. The Montenegrins have achieved a success between the river Boyana and the town of Dulcigno, and recommenced the bombardment of Antivari. On the Black Sea, too, the Turks have suffered a loss in the capture of a transport steamer, with seven hundred men on board, by a Russian cruiser from Sebastopol. The operations against Erzerum have again been suspended on account of heavy snow. Mukhtar Pasha has left that city, surrendering the command to Ismail Pasha, apparently in order to place himself at the head of a small force in the field, which is to defend Baiburt and operate on the flank of the Russians. The Porte has asked for peace through the mediation of England; but Russia seems to be inclined to treat only with Turkey directly, and, before answering England's overtures, calls out fresh reserves, orders cannon, and buys rifles, while Russian organs resent the uncalled-for mediatory offers of the British Government by expressions of defiance. Somewhat oracular utterances of the French and Austrian Cabinets are reported, and there is a great deal of 'sounding' done all around, and much telegraphing about an armistice."

VI

METTERNICH'S MEMOIRS AND OTHER ARTICLES

Mr. Heilprin's review of Metternich's Memoirs, consisting of three articles in the *Nation,* early in 1880, gave him an opportunity of putting on record his own estimate of that statesman. Referring to the first two volumes of the Memoirs he said:

"The Ahitophel of the Emperor Francis and Mentor of the Emperor Ferdinand, who guided the destinies of Austria from the days that followed the disaster at Wagram in July, 1809, to the day of his own downfall, March 13, 1848; the man who coped with Haugwitz, Stein, and Canning, and more than once led Hardenberg, Nesselrode, and Talleyrand; who dazzled and irritated Alexander I. by his sagacity, subdued Frederic William III. by his consistency, and won the admiration of Napoleon by the astute use of his tongue; who, after surrendering his master's daughter to his French conqueror, sealed the latter's doom by joining his foes on the eve of the battle of Leipzig; who was the leading genius, the great wire-puller, of the Congress of Vienna, and the dictator of reaction at Carlsbad, Troppau, Laybach, and Verona; who guarded the equilibrium and peace of Europe against Russia under Nicholas and against France under Louis-Philippe; who supported the bloody absolutism of Ferdinand of Naples, of Ferdinand of Spain, of Dom Miguel, and of Sultan Mahmoud; who, always eager to stifle every popular movement within his reach, kept Silvio Pellico, Ypsilanti, and Kossuth prisoners in his fortresses; whose systematic conservatism and cunningly procrastinating policy preserved the prestige of Austria abroad, but made her glide toward dissolution from within — Prince Metternich has revealed himself in autobiographical sketches, reports, and notes, selected and published by his son: who should not hasten to read them? Two

umes from the pen of a man who made so much history, who l all the threads of European diplomacy in his hands through f a century, ought to be a mine of historical information, olitical wisdom of some sort or other, of piquant revelations. or our part we feel greatly disappointed. We have read and ested Metternich's posthumous history of his time down to 15, with his contemporary communications, and our gain for general knowledge of that extraordinary period is — com- ed to what we were entitled to expect — exceedingly slight. e two volumes before us hardly contain a fact that was not own a great many years ago, hardly a reflection that is seri- ly worth pondering, hardly a personal sketch that has not en better and more faithfully executed by many a writer of s exalted standing. These papers — the reports especially — e certainly worth reading, but, to those familiar with the his- ry of the period, merely for the sake of refreshing impres- ons obtained from other and more copious sources. Hundreds f striking events are touched upon, and scores of historical haracters lightly drawn, by Metternich, and yet hardly an event r a character is modified in its aspect from what we long ago earned it to be. The writer himself, though he labors hard to aint himself for posterity, and, besides, betrays himself by any an unguarded stroke of the pen, remains the Metternich whom Europe knew when he guided Francis and covered Ferdi- nand. The principal satisfaction which these memoirs give us is the knowledge that so great an authority has so little to teach us. . . .

Napoleon is never lost sight of in these Memoirs, but the great historical page in them, in the writer's estimation, is that which describes Metternich's meeting with Napoleon at Dres- den, in June, 1813, when the decision between Europe and the French Empire was to be rendered by the oracle of Austria. This page of history, were it new, would suffice to make the book valuable; but Metternich made it known in 1820, Thiers reproduced it *mutatis mutandis* in his 'History of the Consulate and the Empire,' and Helfert gave it entire in his 'Marie Louise.'

After the destruction of 'the grand army' on the frozen plains of Russia, Metternich had strenuously prepared Austria

for the rôle of armed mediator between Napoleon and northern Europe. Napoleon had as strenuously armed anew for maintaining his hold on Germany and recovering his military prestige. But his resources were crippled and his armies were raw levies, while the forces of Austria had strongly recuperated since Wagram, and were now gathering in Bohemia on the flank of the French. The respective positions were well known to both Napoleon and Metternich, when they met and conversed for nine hours at the Marcolini palace; but the conqueror, elated by advantages gained over the Russians and Prussians at Lützen and Bautzen, was again inclined to deceive himself, and tried by turns to cow and coax the representative of his father-in-law, while Metternich was fully prepared both for his Jovelike menaces and almost cringing appeals, and cruelly bent on wounding and humbling him. He certainly achieved the one and the other, but it is hard to say *cui bono*. If a rupture was the foregone conclusion, what use was there for him in the prolongation of the armistice between the French and the allies, which was the small result of the great scene? If the real aim was the forcing of Napoleon into accepting the armed mediation, which would have at once raised Austria to the position of arbiter of Europe, a less vindictively arrogant, less venomously provoking way of treating was certainly demanded. The whole affair seems to have been the great pride of Metternich, but it strikes us that it is in reality the great blot on his well-merited reputation for cold shrewdness; that Thiers is right when he ascribes the advantage gained to the opposite side; that Napoleon, with all his passion, feigned and real, succeeded in overmatching his adversary, who this time was satisfied with a sentimental gain. Fortune, it is true, had already abandoned Napoleon, and his gain was illusory. The die was soon cast, and Kulm and Leipzig followed.

Great, indeed, must have been Metternich's proud excitement when he came out of the Marcolini palace, leaving Napoleon impotently raging behind him. But this feeling is not described or alluded to. Nor can we discover any other personal feeling of his own expressed in Metternich's autobiographical narratives. He writes of Austria's defeats and successes, of her deepest disgrace or sudden recovery, with the

coolness of a diplomatic machine. He writes so of himself — in 1829, in 1844, in 1853. His own fortunes were closely bound up with those of Austria, and he zealously, assiduously, cleverly labored for the promotion of her interests, as he understood them; and in so doing he seems to have sincerely believed he was also working for the general good of Europe. His reports reflect both his sincere zeal and great ability. The restoration of the preponderance of Austria in the centre of the continent; the establishment of a universal equilibrium of power through the curbing of France and Prussia as disturbing elements; the subsequent preservation of peace at any cost; the guarding of all states against democratic movements; the prevention of all shocks from within or without — these were his public aims, and no sentimentalism — we were almost inclined to say, no sentiment — of any kind obstructed his way towards his goal. What were to him the national aspirations of Germany, Italy, Hungary, or Poland? He knew no nations, no peoples; only states, or rather empires."

County Names

A novel suggestion, that was well worth heeding at a time when there were still counties to be named, was conveyed in Mr. Heilprin's article on "County Names," in the *Nation* of August 5, 1880:

"Fires are raging in Franklin County, Maine." In what part of the State is Franklin County? The answer is easily found in a gazetteer, if we possess one, or, after some search, in an atlas, if the children have not taken it to school: it is a western county, bordering on Canada. "Franklin County, Missouri, has suffered heavily by the late floods." Where is *that* county situated? It is an eastern county, bounded partly by the Missouri River. "Franklin County, Kentucky, promises abundant crops." Is that situated west, or east? No, it is a northern county, intersected by the Kentucky River. Franklin County, Tennessee, which "is infested by locusts," is a southern county. Franklin County, Ohio, which "has been completely cleared of tramps," is in the centre of the State;

and Franklin County, Iowa, where "the inhabitants are preparing to celebrate a grand anniversary," is north-central. Some people all over Maine, Missouri, Kentucky, etc., when reading a piece of news concerning their own Franklin County, may know where that division of their State is situated; outside the respective State not one in a thousand inhabitants of the United States has the faintest idea of the location of the county referred to in the report. How could it be otherwise? Were the State divisions named Washington, Adams, Jefferson, Madison, etc., and were a certain order of symmetry preserved in the geographical application of the names of our immortals, there would perhaps be a possibility of learning how to locate in each State its Washington County or Franklin County. But this is not the case. Geographically, as we have seen, the greatest disorder prevails, and the number of our immortals is endless. In Southern Illinois, for instance, the names are thus placed in tiers: Madison, Bond, Fayette, Effingham, Jasper, Crawford, St. Clair, Clinton, Marion, Clay; and in South Indiana thus: Daviess, Martin, Orange, Washington, Clark, Gibson, Pike, Dubois, Crawford, Harrison, Floyd. No amount of reading will familiarize one with a twentieth part of the counties of the United States, as to their location, outside of one's own State.

Nor will any amount of travelling. Any Westerner who has travelled repeatedly, and by various roads, between Chicago and the Atlantic seaboard will remember a considerable number of towns, rivers, natural sites, and even unimportant stations. He will never forget Toledo, Cleveland, or Buffalo; Pittsburg, Altoona, or Harrisburg; Trenton, New Brunswick, or Newark; Syracuse, Utica, or Albany; the Juniata, the Susquehanna, or the Delaware; the sight of the Alleghanies, the Highlands, or the Catskills. He will remember places where he noticed a picturesque hill or cascade, a beautiful sunrise or sunset, or particular signs of prosperity; places where he drank abominable coffee after a sleepless night, where he was cheated by the waiter, or stopped for hours on account of an accident. His recollections will be checkered and variously instructive. But he may in ten lengthy journeys never have learned the name of a single county. No sign, no mark of a boundary, no call

of a conductor ever indicated such a name. He never learned that it was on the border of Cambria and Blair Counties that he crossed the ridges of the Alleghanies; that it was the hills of Mifflin County which charmed him so much on the banks of the Juniata; that it was in Dauphin that the train was delayed on the Susquehanna; that the Delaware, where he crossed it, flowed between Bucks and Mercer; that the beautiful surroundings of West Point formed a part of Orange; or that the peaks of the Catskills towered above each other in Greene. Nor does he, while reading of things and events in Cambria, Blair, Mifflin, Dauphin, and so forth, suspect that he has traversed or skirted those counties; and he thus never connects the subjects read about with what he has seen with his own eyes. Only a few names form exceptions: Juniata County he will naturally connect with the river of the same name, and Albany County with the capital of New York. In the same way we involuntarily connect, in reading, Appomattox County with Appomattox Court-House, where Lee surrendered to Grant, and Spottsylvania County with Spottsylvania Court-House, where the armies of those generals so desperately grappled with each other a year earlier; and we locate in our mind — following our historical associations — the former county somewhere beyond Richmond, and the latter beyond the Rappahannock. But how many of us have learned to associate Henrico County with the siege of Richmond, or Dinwiddie County with the siege of Petersburg?

The exceptions stated above — Juniata, Albany — show two rational ways of naming territorial divisions, and, in fact, we doubt whether there are any other. The French adopted the one when, shortly after the outbreak of the Revolution, they replaced the historical divisions of their country — Burgundy, Languedoc, Touraine, Berry, etc., which had become obsolete or inadequate — by new ones, known as departments. These they named after their main geographical features, in a manner equally systematic and instructive. Some received their names from mountains: Ardennes, Vosges, Puy-de-Dôme, Jura, Hautes-Pyrénées, Basses-Pyrénées, etc.; most others — like our Juniata County — from rivers: Somme, Seine, Oise, Seine-et-Oise, Marne, Rhône, Loire, Loire-Inférieure, Gironde, Haute-

Had the naming-committee ir departmental nomenclature of such names as Montaigne, , Voltaire, and possibly Condé and Lafayette — these two to ions into Guillotin and Marat, ouis and Jeanne d'Arc, and, ir and Rochefort, and so forth. m Kentucky downward, fol- ch, Franklin County, Maine. Franklin County, Missouri, nty, Kentucky, Kentucky-and- nessee, Upper Elk; Franklin nklin County, Iowa, Iowa-and- f the northeastern divisions of e — instead of Clinton, Essex, Saranac, Adirondack, Upper Lake. There would be mean- variety in the names — all of ight (or more) Washingtons, wo Franklins, etc. The nam- d geographical knowledge, dis- to agree — more of all these committees generally give evi-

ther rational way of naming luded to above in the mention ce of calling a division after exceptions — of which France pe. Of course we do not refer , nearly corresponding to our a, Brabant, Flanders, Branden- a, Tyrol, Styria, Croatia, Tran- sia, etc. The administrative a, and Russia, for instance — s, administrative districts, and their capitals, thus: Madrid, Alessandria, Coni, Novara, Dantzic, Marienwerder; St.

Petersburg, Novgorod, Tver, Moscow. Only a few of the Russian governments, such as happen to coincide with historical divisions — like Bessarabia, Courland, and Esthonia — form exceptions. Nor are the exceptions numerous in Scotland or Ireland, while in England a mixed nomenclature prevails — the counties of the centre bearing mostly names of towns, like Lincoln, Nottingham, Derby, Stafford, Leicester, Warwick, Worcester; and those of the southeast, southwest, and extreme north historical names, like Essex, Kent, Sussex, Devon, Cornwall, Northumberland, Cumberland. The general European plan has been in the main adopted by California, and the seafarer who sails along her shores from Oregon to the border of Mexico, and is shown the coast towns of Klamath, Humboldt, Mendocino, San Francisco, Santa Cruz, Monterey, San Luis Obispo, Santa Barbara, and San Diego, will also have learned where the counties of the same names are situated. These sonorous names, it is true, immortalize none of our Revolutionary or post-Revolutionary heroes; but California, if led by hero-worship, might also have inscribed on her soil the name of an earlier Kalloch, De Young, or Kearney. Our youngest State, Colorado, has in its counties a mixture, without system, of all kinds of words, Indian, Spanish, and English — from Arapahoe, through La Plata and Las Animas, to Summit and Weld. May the States to be admitted be wiser in their county nomenclatures, and while hallowing no more ground with patristic appellations, save us also from such names of dubious sound as are Indiana's Dubois and Floyd! It is too much to hope that there is any possibility of transforming the thousands of names we have — more meaningless than would be A, B, C, or X, Y, Z — into others indicative of natural features or administrative connections, and thus easily learned and better remembered."

VII

CONTRIBUTIONS TO BOTH THE *NATION* AND THE *EVENING POST*

After the amalgamation of the *Nation* with the *Evening Post,* in 1881, Mr. Heilprin's opportunities of writing on political topics widened. Some of his editorials on foreign affairs appeared in the latter paper only, but the majority were published in both journals. He wrote, to mention only a few, on "The First Year of Alexander III.," "The Oldest of Emperors" (William I.), on Herzegovina, on Marshal Serrano's *Coup* in 1882, on "The State of Affairs in Russia" (1883), "Nationality Strifes in Austria-Hungary" (1883), "The Crisis in Norway" (1883), "Croatia *versus* Hungary" (1883), "The Vienna Anniversary" (1883), "Bismarck's Coalition" (1883), "Bismarck and the Reichstag" (1884), "The Succession in Holland and Luxemburg" (1884), "Spanish Affairs" (1884), "France as a Colonizer" (1885), "The Pan-Bulgarian Revolution" (1885), "War in the Balkans" (1885), "Parliamentary Anarchy in Germany" (1886), "The Troubles in Galicia" (1886), "The Czar and His People" (1886), "Rumania in the Eastern Conflict" (1886), and "Does Germany Anticipate War?" (1886). In addition to these editorial contributions, there were published in the *Post* and *Nation* during this period, and down to the day of his death, many reviews from Mr. Heilprin's indefatigable pen.

From the mass of his critical articles I can select only a few. Considerations of space prevent me from including some of the most important, such as the three on "The Revised Old Testament," which appeared in 1885.

Russia and the Russians.[1]

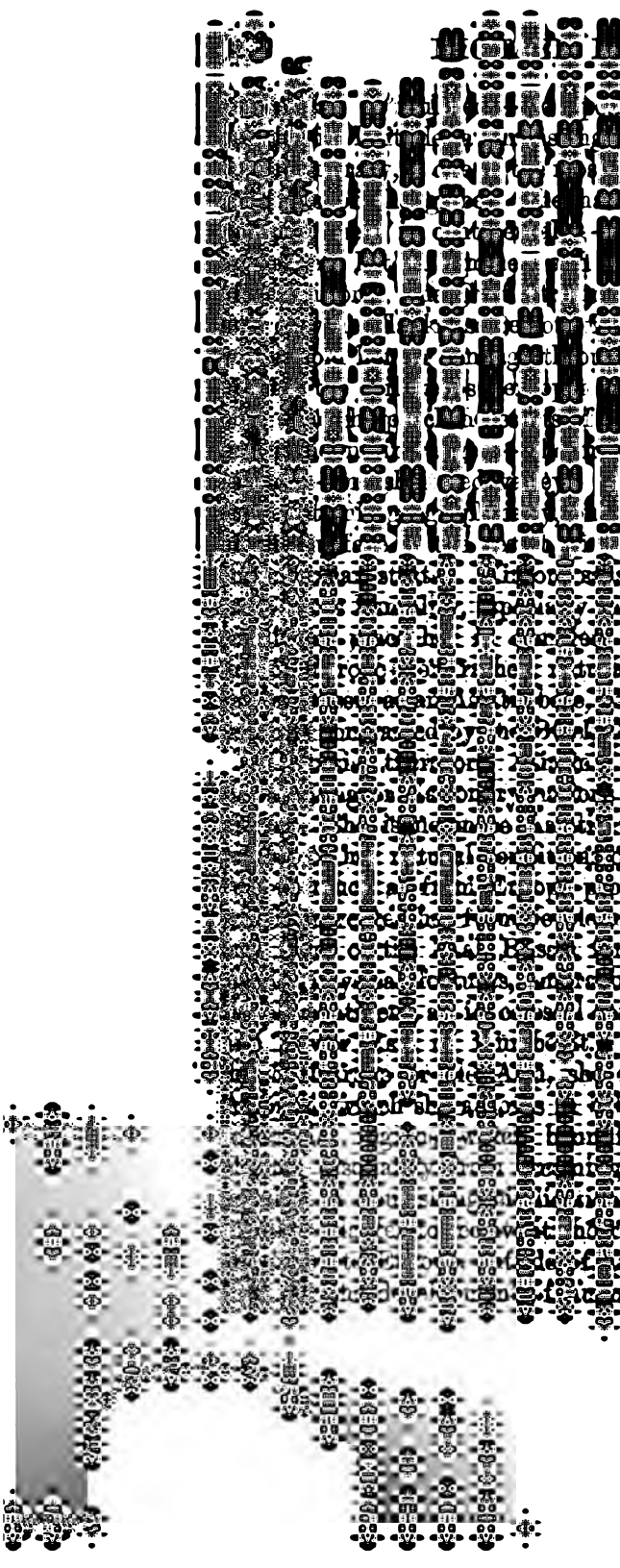
I

There is hardly an exaggeration in saying that the number of books on Russia is increasing from day to day, but good works

[1] *L'Empire des Tsars et les Russes.* Par Anatole Leroy-Beaulieu. Tome i. Le pays et les habitants. Paris: Librairie Hachette et Cie.

on that empire are yet as rare as, say, sound and impartial works on the United States. Mackenzie Wallace's "Russia," a production of incomparably lighter calibre than Tocqueville's "Democracy in America," is still equally exceptional. Leroy-Beaulieu's "L'Empire des Tsars" is evidently destined to become for a time *the* book on the subject. Among studies of countries by foreigners it cannot fail to take place in the very foremost rank, owing to unbiassed observation on the spot, diligent research among the best authorities in the national literature and press, a vast corrective correspondence with well-informed natives, and a minute sifting of results by a mind conscientiously critical. It is too extensive, and presupposes too much preliminary knowledge on the part of its public, to become as popular as Wallace's pleasing composition, and it nowhere equals that original play of genius with problems apparently novel which charms us in Tocqueville's "Democracy"; but it surpasses the latter in breadth, and the former both in breadth and depth, and, if less attractive than either, it not only enlightens the reader by its slow but lucid demonstrations, but delights him by its felicitous illustrations and a diction worthy of the best periods of French literature. In a word, it is a great work. It disarms the reviewer's critical propensity, and allows him only to follow the author closely in some of his salient generalizations and summings-up. It is to consist of three, or possibly four, large volumes, but only the first is as yet before us.

The author considers the shape and extent of European Russia, and asks himself: Does it really form a part of Europe, differing from the rest only in proportions, in the scale of dimensions? or does its prodigious widening fully distinguish and separate it from Occidental Europe? Are not the conditions of civilization modified by the vastness of the area? Are Russia's geographical structure, its soil and climate, European? Entire Europe forms a peninsular triangle, the broad base of which rests completely on Asia and is bodily joined to it. Thus joined to Asia, Russia preserves that continent's configuration. Europe proper is distinguished from all other portions of the globe by two main traits, which have rendered it the natural seat of civilization: it is cut into parts by seas,



k with Humboldt — and it
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mpact, the most continental,
none of Europe's maritime
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most untempered by seasons
oes not reach her; the seas
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most of the year; the flat-
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s and without mountains, she
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Is she to be classed among
of the remote East? By no
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beria. Russia is one of those
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in its first days, she is ad-
aise it. Like North America,
r extreme belts, an immense
an activity on a vaster scale.

Her climate is inclement, her forests are meagre, her steppes treeless; but what man needs is less richness of the soil than the facility of subduing and using it. Russia's fauna is poor, her flora is poor; there is no variety, no display of power, nothing grand — except the vastness of the land; but neither has her living nature, in its debility — in its lack of fecundity and robustness — any strength to oppose to man. The soil is tame and docile. Unlike Brazil or Hindostan, where man becomes the petty slave of a luxuriant, glowing, wondrous, and unconquerable nature, the vast territory of Russia is made for free labor; it needs no African negro, no Chinese cooly. The Russian soil does not use up its cultivator; it does not threaten his race with degeneracy; it bears no creoles.

The Russian people, the *muzhik,* is the main colonizer, almost the sole colonizer, of the Russian lands. This fact, apparently so simple, hides difficulties and inferiorities of all kinds. Instead of the most enterprising men of the most advanced countries of Europe, such as are colonizing the United States and Australia, we find here a people kept back by nature and history — a people of peasants, who yesterday were serfs; instead of freedom, independence, and individual sovereignty, we see an autocratic government, a pestering administration, communal bonds tying man to man and the tiller to the ground. Russia's colonizing expansion is crippled by standing armies, a long military service, a narrow centralization, an omnipotent bureaucracy. These galling drawbacks have repelled European immigration, and will continue to repel it. Russia will in vain offer to the immigrant admirable lands waiting for the plough — her very next neighbors of Scandinavia prefer to wander beyond the ocean to the northwest of the United States.

And Russia is a country in process of colonization. Though old, she is still forming. She is at the same time an empire of a thousand years and a colony of a century or two. She may be likened to the United States and also to Turkey. She is a country both new and old; a semi-Asiatic monarchy and young European colony; a Janus with one face old and worn out and the other adolescent, almost infantile. This duality is the source of striking contrasts whithersoever we turn in Russia: contrasts in private life, in character, in the state;

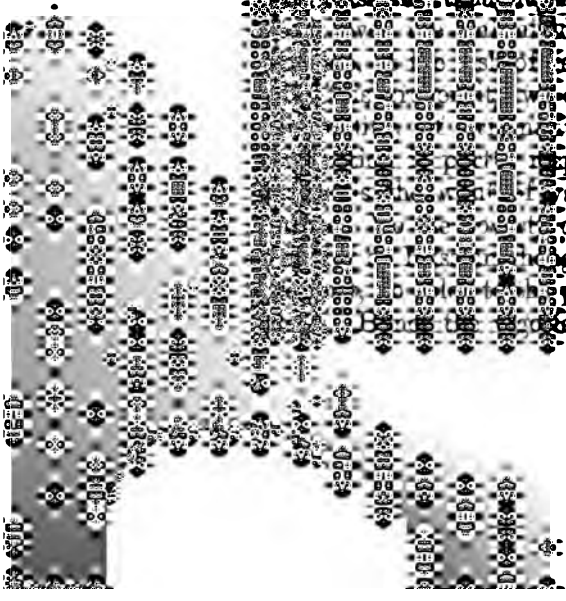
contrasts so frequent that they form the rule, a law of contradictions. Everything has contributed to produce them: a position between Asia and Europe — so to say, astride of both; a blending of races — Slavic, Finnic, Tartaric — far from complete; a historical past formed by the contests of two worlds, by violently alternating phases. From these contrasts spring the different judgments passed on Russia, the falsity of which lies very often in exhibiting only one side. The law of contradictions is further discoverable in society, whose classes, high and low, are divided by a wide chasm; in the political field, where liberalism is often attempted, but generally weighted down by inveterate inertia; even in the individual, in his ideas, sentiments, and manners. The contrast is both in form and in essence, in the single man as well as in the nation. The state, a military monarchy and young colony at the same time, has the weakness of either, and the full force of neither. With deserts to people and clear, Russia is doomed by her contact with Europe to bear military and financial burdens like the oldest and most civilized of nations. Her tasks are those of both Europe and America, while her instruments are inferior to those of either. She resembles an actor forced to play before having learned his part — a man trying to acquire his first education amid the toils and struggles of mature age.

The least Slavic of all the Slavs, the Great-Russian, has been the Slavic colonizer *par excellence*. Treated by his enemies as a Turanian, a Mongolian, an Asiatic, his national origins are found in the West: on the Dnieper, between the Dnieper and the Düna, at Novgorod. His march has been from Europe to Asia; from White Russia to beyond the Ural, the Caspian, and the Caucasus. His destinies are imaged in the great river, the course of which he has followed from its source to its delta: like the Volga, he has run his course from Europe to Asia. When, under Ivan III. and Ivan IV., and later under Peter the Great, he turned as a foe toward the Baltic and the West, he only retraced his steps toward his European base. His history is the history of a struggle with Asia. The centuries of Tartar domination never made him forget his European origin. Victorious over Asia, he yet, during his advance from the Dnieper to the Ural, became both morally and

physically changed by his contact with the populations subdued and absorbed. There is in the Russian more heaviness, both of body and mind, than in Slavs of less mixed blood; Aryan beauty is there more rare. The Great-Russian often betrays Finnic descent by his flat face, small eyes, and prominent cheek-bones. To Finnic influence and Tartar oppression he owes greater harshness, but also greater robustness, than marks other Slavs. He has less independence and individuality; he has more patience and consistency. He has not that mobility which has been the bane of the Pole. The extreme ductility of the Slav has in him been tempered by foreign, chiefly Finnic, alloy; the loss of purity is compensated for by a gain in solidity. The fusion of race, as elsewhere, has been productive of vigor at the expense of refinement. But Finnic and Tartar blood has not transformed the Great-Russians into Finns or Tartars. They are not Aryans and Slavs merely by language and historical development. They are much more properly Slavs than the French or Spaniards are Latins. A considerable portion of their blood is Caucasian, Slavic. The proportion can hardly be determined; it varies according to region and class. In the bulk of the nation Slavic blood probably preponderates.

II

Nature in Russia presents two opposite aspects — vastness and vacuity. Her enormous territories are devoid of variety of form and variety of color. Animate as well as inanimate nature lacks grandeur and power. The picturesque is almost imperceptible. Travel through the Russian plains produces a feeling of satiety almost like a sea-voyage. You open your eyes after a night's sleep in a steamer or a railway-train, and perceive no change of place. The grandeur of the rivers diminishes their beauty: the finest banks are lowered into insignificance by distance. Everywhere you see the same animals, the same plants, the same trees. The cultivated fields vie in monotony with the forest and the steppe. There are no hamlets, no isolated farms. The Russian seems to dread solitude in the boundless space which surrounds him. The community of property which prevails among the peasants adds to the defect of nature. Here



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latter is owing in great part the
his country offers no images to
, no freshness to impressions or
and lifelessness of the ancient

mythology of the Russian Slavs, as compared with the myths of the Greeks or the Scandinavians. It was amid the grand scenery of the Caucasus, at the very extremity of European Russia — whither a suspicious police has exiled so many literary talents — that Pushkin and Lermontoff found poetical inspiration and a lofty romanticism.

What there is of diversity, picturesqueness, and beauty in rural Russia is derived more from time than from space, from the alternation of seasons rather than from scenery. In the south, especially in tropical lands, the earth glows with tints, but the seasons are hardly distinguishable. In a northern continental country like Great Russia the seasons are strikingly unlike each other; they robe the earth in markedly new colors. The thus varying aspects of nature restore to the Russian the variety of impressions and sentiments which the soil refuses him. Without leaving his village, he sees alternations of climate and aspect such as others witness in passing and repassing through thirty degrees of latitude between the pole and the equator. These alternations act upon character and temperament, upon the imagination and the mind. In Russia every season has its labors, its holidays, its pleasures, different songs, and even different dances. To the violent alternations of the seasons, which temper him for all climates, the Russian owes a peculiar flexibility and elasticity of organs — a facility of passing from one sentiment or idea to another. To the same cause may be attributed much that in the Russian appears unbridled, eccentric, rough. If he has little intellectual originality and a poorly-developed inventive faculty, he is very often original in his tastes, manners, and expressions. He sometimes evinces a *bizarrerie* closely bordering on insanity. Ivan the Terrible, Peter the Great, and Paul are examples of it among his sovereigns. Like his climate, he easily goes from one extreme to the other: his changes of mood, thought, or feeling are striking; the oscillations of his intellect and heart embrace a wide range. He rapidly passes from activity to torpor, from tenderness to rage, from joviality to moroseness, from enthusiasm to apathy, from submission and resignation to revolt; he displays in rapid turns all the variations of heat and cold, calm and tempest. In the individual, in society, in the Government, this propensity

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now existing. Nihilism constitutes no party. Its name, by which we generally designate the doctrines of Russian revolutionists of all shades — federalists, terrorists, anarchists, communists, etc. — is rejected by most of them. But Russian radicalism deserves it both by its scientific nullity and its destructively negative attitude toward civilization — toward Christian and classical culture, as developed by the Germano-Latin races. The Russian, half a century ago, adored that culture with the ardor of a neophyte; he swore by the liberal principles it had proclaimed since 1789; he has discovered its shallowness and hollowness, and, with the mobility which carries him from one extreme to the other, with the bitterness of a cruelly deceived and undeceived believer, he blasphemes the object of his former worship; he vows to destroy the proud temple erected to those modern idols which, under the usurped names of liberty, equality, and fraternity, give sanction to error, discord, and the sordid bondage of poverty. This is, indeed, a sad self-emancipation of the Russian conscience; a violent reaction against the intellectual, social, and scientific supremacy of Europe. The part of initiator and savior is henceforth to be acted by the people till now left in ignorance; light is to come from the dweller in darkness. Having lost his faith in Europe, the Russian has again begun to believe in Muscovy. He finds his despised country superior to others on account of its very inferiority. This is logical. Modern civilization being once condemned, that country is best adapted for future creations in which the past has left the freest field to the present; where modern culture and art have built so little and have penetrated so slightly beneath the surface that the necessary clearing and uprooting are most easy. The Russian people, having the least to lose by destruction, thus becomes the chosen people of radical revolution. And thus, through the negations of nationality and fatherland, the Russian revolutionist returns to the glorification of country and people, which are exalted in his eyes by their nudity and poverty. — *Nation,* May and June, 1882.

The Site of Paradise [1]

Where lay Adam and Eve's Paradise? or, Where is the Garden of Eden? was during former ages a question of profound religious curiosity. Where did the legends of the Hebrews place the first abode of man? is in our days still a question of considerable interest among Biblical critics. To the one and the other most diverse answers have been rendered by scholars. The difficulty consists in identifying two of the four streams (or "rivers") into which, according to the story of Genesis (ii. 8–14), was parted the stream that came out of Eden to water the garden. There is no dispute concerning the two named last: they are the Tigris (in Hebrew, Hiddekel) and Euphrates; but where is the Pison, which compasses the whole land of Havilah, where excellent gold is found, and also bdellium and the *shōham*-stone? And where is the Gihon, which compasses the whole land of Cush? Our author examines one after another the solutions propounded by the various commentators, and states his own, with an array of learning which, in the old field of Biblical inquiry, shows him a worthy disciple of his father, Franz Delitzsch, and in the new domain of Assyriology a compeer of Oppert, Schrader, and other famous students. It is needless to follow him here in his survey, in which he has been preceded by so many expounders of Genesis, or in his refutations, which are not novel either; but we may be allowed, for the sake of such of our readers as are not familiar with this curious chapter of laborious exegesis and fanciful speculation, to convey an idea of the maze of conflicting opinions by an abridged statement of a recent German commentator:

"The exegetical views respecting the passage divide themselves into the historical, the allegorical, and the mythical. The historical views, again, fall into two classes: those that maintain the possibility of yet determining the region of Paradise, and such as suppose the configuration of the earth to have been so changed by the flood that the place of union of the four rivers cannot now be pointed out. . . . Calvin, Huetius, Bochart, and others: — Paradise lay in

[1] *Wo lag das Paradies?* Eine biblisch-assyriologische Studie. Mit zahlreichen assyriologischen Beiträgen zur biblischen Länder- und Völkerkunde und einer Karte Babyloniens. Von Dr. Friedrich Delitzsch, Professor der Assyriologie an der Universität Leipzig. Leipzig. 1881.

the district in which the Euphrates and Tigris unite; the Pison and the Gihon are the two principal mouths of the Shat-al-Arab. . . . Hopkinson: — Paradise was the region of Babylon; the two canals of the Euphrates form half the number of the four rivers. . . . Harduin: — In Galilee. . . . Hasse: — Paradise lay in East Prussia. . . . Clericus and others: — Paradise lay in Syria. . . . The mythico-theological, or strictly mythological, view makes it the story of the four world-rivers that come from the hills of heaven and wander over the earth. . . . According to the historical view of Reland and Calmet, Pison denotes the Phasis, which rises in the Moschian mountains, is connected with the gold-land of Colchis so famed in antiquity (Colchis = Havilah), and flows into the Black Sea; Gihon is the Aras, or Araxes, which likewise rises in Armenia, and flows into the Caspian Sea; Cush is the land of the Cossæans, which Strabo and Diodorus place in the neighborhood of Media and the Caspian Sea. According to this, Armenia would be the territory of the ancient Paradise. . . . Finally, according to [Franz] Delitzsch, the Pison must refer to the Indus, and its river territory to India, while the Gihon is the Nile."

To complete the picture, let us add that the first stream, Pison, has been identified not only with the Phasis and the Indus, but also with the Nile, the Blue Nile, the Ganges, the Hyphasis, the Hydaspes, the Araxes, the Chrysorrhoas, the Besynga of Further India, the Danube, etc.; and that among the various identifications of the Gihon there is also this, *Gihon = Oceanus* — linguistically thus explained by the late Tayler Lewis: ὁ Γι-όν — ὁ Γεων — ὁ Κεων — ὁ Κεαν — Ω-κεαν-ος, or, the Gihon, the Kehan, the Kean, the Ocean-river. Professor Friedrich Delitzsch's critical speculations — which, as to the main point, are a restatement, with important modifications, of the old view of J. Hopkinson, in his *Descriptio Paradisi* (1594) — carry us back to the land and language of Babylonia. Everything in the earliest history of mankind, as told in the first chapters of Genesis, points toward that country. Noah's ark was uplifted on the first day of the deluge: the land where it was built must have been a lowland, argues our author. No allusion is made to vast expanses traversed by the ark before it reached Mount Ararat: the lowland must, therefore, have been at no great distance from eastern Armenia; Babylonia is a lowland thus situated. Postdiluvian mankind builds its world-tower on

the plain of Babylonia. Eden itself is distinctly connected with the Tigris and Euphrates, rivers stated to have flowed out of it. That well-watered garden-land cannot have been in Assyria, for there the Tigris and Euphrates could not be imagined issuing from it as branches of one stream: it must be sought in the Babylonian plain. This plain, bordered by the Tigris and Euphrates, has, it is true, no room for two other rivers; but must we, asks Professor Delitzsch, following Hopkinson, recognize in the Pison and Gihon two streams resembling in character the Tigris and Euphrates? Is not the word *nāhār* (which the Authorized Version renders by *river*) used in Hebrew, as it is in Arabic and Babylonian, also of canals? Is not the *nāhār* Chebar, on the banks of which Ezekiel saw his vision, clearly and repeatedly stated to have been "in the land of the Chaldeans" — that is, in Babylonia — and not in Mesopotamia, where it has been erroneously sought? The cuneiform inscriptions have lists of *nārāti*, or streams, placing canals side by side with the Tigris and Euphrates. The parting of the stream of Paradise into several branches obviously refers to irrigation.

But here a difficulty arises: Should canals constructed by the hand of man have entered into the description of Paradise, prepared for an abode of the first of the species? Professor Delitzsch, who has very little reverence for the legend he treats of, and believes it to be derived from a Babylonian source, has no hesitation in discarding this objection. There was hardly any difference perceptible, he thinks, between the two great rivers and the canals of Babylonia. The canals were broad and navigable like the rivers, gave like these rise to other smaller water courses, and were of so exceedingly ancient an origin that the narrator could, without committing a flagrant anachronism, connect them with the very planting of the divine garden. Arrian, in describing the Pallacopas canal, found it necessary to remark that it was an artificial channel, and not a river derived from springs. Moreover, it is certain that a part of the Babylonian canals are not of originally artificial construction, but ancient river beds or branches of the Euphrates and Tigris, converted into navigable or irrigating channels when those two rivers had carved out their permanent beds. The canals Pison and Gihon may have been known as such branches of the main streams.

Now, where lay the lands Havilah and Cush, around which hose water-courses wound? Havilah, answers Delitzsch, is the ast-north-easterly portion of the Syrian Desert, bordering on he lower Euphrates, a tract of which is designated by the Arabs as Ard-el-Halat, land of dunes. The Hebrew name (*ḥāvīlāh*, or *ha-ḥăvīlāh*, the sandy, from *ḥōl*, sand) has the same meaning. Gold is proved by cuneiform inscriptions to have been a product of the adjoining territory of Bit-Yakin, northeast of the mouth of the Euphrates. Bdellium, according to the testimony of Pliny, was a native product of Babylonia. The stone shoham is the *sāmtu* (fem. of *sāmu*) of the inscriptions, a famous mineral product of Meluha, a Babylonian district rich in precious stones. Thus everything connected with Havilah leads us back to the vicinity of the lower Euphrates. The Cush of the story of Paradise is surely not the African Cush, Cush in the narrower sense, or Ethiopia. It is the land of the Kaššu of the inscriptions, who had separated from their kindred in the mountain ranges north of Susiana, the Cossæans of the classical writers, and established themselves as rulers of central Babylonia — a people, perhaps, identical with the Casdim, or Chaldeans, of the Scriptures. The Pison of Havilah is the Pallacopas of the Greeks (*pallaco* = Heb. *peleg*, Ass. *palgu*, canal), that great canal west of the Euphrates, extending from the neighborhood of Babylonia to far below the present mouth of the river in the Persian Gulf, of which Ritter surmised that it presented the most ancient and most direct bed of the great stream, in its eastward-trending course to the gulf. The stream compassing the land of Cush is the canal Shat en-Nil, forming an opposite curve east of the Euphrates to that of the Pallacopas on the west, and identical with the Arahtu of the Assyrian inscriptions, mentioned as *nār* (river or canal) immediately after the Tigris and Euphrates, and also designated by a non-Semitic name which can be deciphered as Guhana — that is, Gihon.

Thus the four water courses into which the stream of Eden was parted on coming out of it were the Pallacopas, the Shat en-Nil, and the lower Euphrates and Tigris, the former three branching off from the middle Euphrates near Babylon, and the Tigris communicating with it through a network of canals and little channels. The middle Euphrates is the main river,

watering with its numberless branches the country around and north of Babylon, which is Eden. The Euphrates alone waters it, for the Tigris, flowing through a lower bed, only receives water, and imparts none, through the connecting channels. The character of this country, as described by Herodotus, Xenophon, Strabo, and Ammianus Marcellinus, was in antiquity such as fully to deserve the appellation bestowed upon it. It was charming beyond comparison by its luxuriant vegetation, variety of excellent products, and marvellous cultivation. The Babylonians and Assyrians called it Kar-Duniaš, grove of the God Duniaš, in the non-Semitic equivalent of which name the syllable *Kar* is replaced by *Gin*, corresponding to the Hebrew *gan* in *gan ēden*, garden of Eden. The most ancient non-Semitic name of the city and district of Babylon was Tintira, meaning grove of life, which reminds one of the tree of life in the narrative of Genesis. The Hebrew word *ēden*, delight, may, in this combination, be a phonetic imitation of the non-Semitic *ēdin* of the inscriptions, which means plain.

Unfortunately for the theory so powerfully advanced, almost all the linguistic evidences by which it is supported are still of doubtful value, the etymology of the Babylonian names in most cases, and the reading in some, being disputed by high authorities in this obscure field of inquiry. Were the linguistic points proved, it would be hard to resist the power of the argument, in spite of various difficulties arising from the scanty text of Genesis itself. As it is, although all other solutions of the knotty Biblical problem may be subject to still graver objections, the following questions militate too strongly against Professor Delitzsch's solution: Why, if the stream of Eden be the middle Euphrates, is it left unnamed in the narrative, though it is certain that the Hebrews were perfectly familiar both with the middle and the upper course of that river? Why, if the Pison and Gihon designate the canals Pallacopas and Shat en-Nil, are they said to *compass* lands which the canals only traverse? If the *lower* Tigris be meant by the Hiddekel, why is this river described as flowing in front of Assyria, which lay *above* the central Mesopotamian lowland asserted to be Eden? How should a writer familiar with the whole course of the Tigris deem its lower part a branch of the Euphrates? Why

should Cush, a name which commonly designated Ethiopia, have been used by the narrator in a sense in which it nowhere else occurs in the Scriptures, without the least further definition? Why, on the other hand, is Havilah, if the Arabian borderland so well known to the Hebrews be meant, so fully described by its products? Who tells us that the gold, the bdellium, and the shoham of Babylonia were also characteristic of the adjoining Havilah? But whether these objections, in the present stage of Assyriological studies, be fatal to the theory of Professor Delitzsch or not, we have no hesitation in saying that his dissertation, amplified as it is by supplementary treatises on the ancient geography and ethnology of the Mesopotamian and neighboring countries, of Canaan, Egypt, and Elam, is a perfect treasury of knowledge — made most accessible by excellent indexes — and probably the most brilliant production in all Biblico-Assyriological literature.

— *Nation*, March 15, 1883.

Freeman's "English Towns"[1]

This collection contains papers of two kinds: short sketches, reprinted from the *Saturday Review*, of the same character as the author's "Historical and Architectural Sketches, chiefly Italian," and his "Sketches from the Subject and Neighbor-Lands of Venice," and longer ones, resembling those on cities and countries in the third series of his "Historical Essays," and originally composed and published as addresses to various societies, several of them as presidential opening addresses to the Historical Section of the Archæological Institute. In both kinds of papers the author has, "in revising them for the reprint, made any changes that seemed to be called for, whether by adding, leaving out, or any other form of improvement." The illustrations are in the same style and made by the same artists as those in the "Subject and Neighbor-Lands of Venice." The essays — thirty-one in number, grouped not in the chronological order of composition, but according to geographical divi-

[1] *English Towns and Districts;* a Series of Addresses and Sketches. By Edward A. Freeman, M.A. With illustrations and map. London and New York: Macmillan & Co. 1883.

sions — are mainly devoted to the pointing out of historical and architectural features, not to detailed description, antiquarian or other. Each town is looked on and presented as a whole, with a kind of personal history, and put in its fitting place, as part of the history of England. "The city itself and its history are something greater than any particular object in the city."

A quarter of a century lies between the composition of the oldest and that of the latest of these sketches, but they are all — probably owing in part to the thorough revision, with its various "forms of improvement" — almost equally marked by the intense peculiarities of Mr. Freeman's historical and antiquarian pen. There is constant dissection, analysis, definition of terms, marking of limits, illustration by analogy, elucidation by contrast, presentation of likeness and unlikeness, repetition for the sake of clearness or inculcation — much beautiful work, some that is tedious; here flashes of genius, there almost pedantic hair-splitting; a vast display of knowledge and research, and some of prejudice and conceit. That the book is another rich contribution of the author to English history — though offering only strings of bits of information, and nothing complete in itself — need hardly be said at this stage of Mr. Freeman's fame; nor, on the other hand, that the same knowledge and acumen, with less mannerism, might have made it incomparably more charming.

In "Cardiff and Glamorgan," the first sketch, the historian asks himself these questions: Who were the first inhabitants of the country?

"Were the Britons the earliest wave of Aryan migration in these lands, or were they preceded by an earlier Aryan and Celtic race — that, namely, which consists of the Scots, both of Britain and Ireland? . . . That is to say, is the wide distinction between the two branches of the Celtic race in these islands, between the Scots or Gael, and the Welsh or Britons, a distinction which arose in these islands, or do they represent two successive waves of Aryan migration? . . . And, again, can either branch of the Celtic race, Gael or Britain, claim to be the first inhabitants of the land? Were the Celts preceded by races kindred to the primitive non-Aryan dwellers in Europe, of whom the Finns of the North and the Basques of

nees are remnants? Were the Silurians, whose descend-
n a main element of the population in South Wales and the
ing districts, a people closely akin to the non-Aryan Ibe-
Spain, as 'has been held by two writers, both of great name,
a long interval of ages between them — by Tacitus and by
or Huxley'?"

Freeman, unlike other recent authorities (see "Celtic
," in the *Nation* of July 19) leaves the questions un-
ed, remarking only in regard to the latter points: "I know
hether Britons will be ready to give up Caradoc as a
h brother; I should certainly be unwilling to give him
an Aryan cousin. . . . One thing is plain, that if the
e of South Wales are really of a non-Aryan stock, the
ss of Aryan assimilation has been very thoroughly carried
The British tongue is still living in these parts; if
ue or any other non-Aryan speech ever lived here, it long
became extinct in vale and mountain. That it should have
me extinct through assimilation must appear to Mr. Free-
a very improbable, as he remarks in another essay, "Anglia
nswalliana": "English has not assimilated, though it has
gely displaced, the Welsh and Gaelic tongues, with which it
s no connection beyond the remotest Aryan kindred," while
he tongues of the Dane and the Fleming, as well as those of
e Angle and the Saxon, have all been drawn together by the
traction of a single type of standard English" — which
aches us the lesson, "how easily a standard form of any lan-
age assimilates all the kindred dialects of a country, but how
ittle effect it has on dialects which are not kindred."

What the type of standard English was that attracted and absorbed all other dialects Mr. Freeman tells us in his very elaborate paper on Lincoln ("Lindum Colonia," "an heathen" city on "an hill"): "The tongue which we call English, while it is neither the Northumbrian of York nor the Saxon of Winchester, is the intermediate Anglian speech of Eastern Mercia. . . . It was a Lincolnshire man, a Bourne man, who gave the English language its present shape. . . . We do not speak the tongue of Ælfred; we do not speak the tongue of Waltheof; but we do speak the tongue of Hereward, the tongue in which the chronicler of Peterborough kept on our native annals, till

the pen dropped from his hand as he set down the coming . . . of the King who wore his crown in Coleswegen's church of Wigford." The birth of English learning, however, is traced further back in time, and further north, in "Points in Early Northumbrian History," one of the most interesting, if not the most interesting, of the thirty-one essays of the collection:

"Do not forget that the English tongue, that the earliest compositions in the English tongue, are more ancient than the migration which brought Englishmen to the shores of Britain. The first poets of the English race belonged, not to this our island England, but to the older England on the mainland. Had their tongue been Greek instead of English, their fame would have sounded from one end of heaven to the other. But the poets of our Homeric epic and of our Homeric catalogue, the gleemen who sang the tale of Beowulf and the song of the Traveller, being English, are nameless. But of the first Christian English minstrelsy, of the first recorded English minstrelsy on British ground, the land of Northumberland, the land of Deira, is the parent. Yours [Northumbria's] is Cædmon, the bard of the Creation, the bard of the battles of the patriarchs — he who, a thousand years before Milton wrote, had forestalled Milton, alike in his daring subject and in his majestic treatment."

Here — as often elsewhere — we have Mr. Freeman with all his passionate, almost superstitious, sympathy for everybody and everything in the remote past that promoted the rise, the "making," and "welding," the greatness and literary bloom of England, of English England. He never forgets to teach his hearers or readers to see a blessing in every event, however horrible and shocking, which tended directly or indirectly to "make England England." He graphically describes, under "Exeter," the heroic but vain resistance of that city to the Norman Conqueror, and immediately adds: "But we see none the less that it was for the good of England that Exeter should fall. A question was there decided greater than the question whether England should be ruled by Harold, Eadgar, or William, the question whether England should be one." Northumberland's resistance was equally stout and vain, but "the Norman conquest was, in very truth, a Saxon conquest. It ruled that England should be forever an united kingdom." Going further back, we find Silchester — of whose greatness in Roman times,

as attested by recently dug-up remains, we read a wonderful tale — ruthlessly swept away by the conquering English; but mourn not: "It is because Silchester and places like Silchester were left waste without inhabitants — because those who dwelt in them were cut off by the sword or driven to save their lives in remote corners of Britain or Gaul — because for a hundred years the faith of Christ was wiped out before the faith of Woden — it is because of all this that Britain has not been as Gaul and Spain, and that we still keep the laws and the tongue which we brought from the mouths of the Elbe and the Eider." "Had it been otherwise," we are told under "Carisbrooke," "had the slaughter and havoc by our fathers been less complete, Englishmen would not have remained Englishmen, and Britain would never have become England." The following is, perhaps, the best specimen of the brutal pitch to which Mr. Freeman carries his philosophy of history:

"We were the Turks, and worse than the Turks, of those days; the sword was our only argument; the persecuted Briton had not even the chance of Koran or tribute. But simply because we carried slaughter and havoc to a more fearful pitch than any Turk ever carried them, for that very reason our conquest carried with it the hopes of better things. We stood on the ground which we made without inhabitants, to grow up, not as a mere conquering caste, but as a new people of the land. We stood ready to receive a new faith and a higher civilization, . . . from the Roman and the Scot. . . . We may weep for the monks of Bangor, but the day of their massacre was none the less one of the great days in the growth of the English nation. . . . Deva was the last city which was taken only to be left desolate. When Æthelfrith slew the British monks, part of England was already Christian. . . . And before that same seventh century had passed, Northumberland had become . . . the special home of learning and holiness, the cradle of the history of our people, the cradle of the poetry of our tongue."

Of course our historian does not mean to say that the English exterminators of the Christian Britons acted righteously in their heathen blindness and barbarous ignorance of historic pragmatism; he only delights in the strength and irresistibleness of the English sword and will. Thus speaks the historian of England. Freeman, the antiquarian and student of towers,

gates, and steeples, bows before the same "ruling" of history. He cannot compare Exeter, the English city, as an architectural conglomeration of historical interest, with any of the Continental towns of a class even one degree lower than Venice or Florence, Treves or Ravenna. England has few spots so rich at once in history and art as to rival "the last home of Carolingian kingship on the rock of Laon" or the walls of successive ages — "spreading each round another, like the circles of Ecbatana" — which envelop the minster and the castles of Le Mans; "the Bern of Theodoric by the Adige" or "the Bern of Berchthold by the Aar"; the council-house of Lübeck or Ghent, of Padua or Piacenza; the episcopal palace of Liége or the ducal palace of Dijon; the castled steep of Marburg or the hill of Marburg, with its many-towered church, walls, and gateways. "Yet we need not grieve," he patriotically tells his fellow-patriots, "that we are in this matter poorer than other nations. . . . Why is the history of Nürnberg greater than the history of Exeter? Simply because the history of England is greater than the history of Germany. Why have not our cities such mighty senate-houses, such gorgeous palaces, as the seats of republican freedom or of princely rule among the Italian and Teutonic cities? It is because England was one, while Italy and Germany and Gaul were still divided." England's nobles and prelates were not allowed to grow into sovereign princes, nor her cities and boroughs to grow into sovereign commonwealths. In observations like these the antiquarian Freeman — to whom we are unable to do full justice — again merges in the historian.

— *Nation*, September 6, 1883.

Ancient Israel [1]

I

Half a century ago, ancient Israelitish history was generally written as Roman history was before Niebuhr. It began with

[1] *Geschichte des Volkes Israel.* Von Dr. Bernhard Stade, Professor an der Universität Giessen. Mit Illustrationen und Karten. Vol. I. Berlin. 1887. New York: Westermann. ['Oncken's Weltgeschichte in Einzeldarstellungen.']

Ur of the Chaldees and the stories of the patriarchs, just as the history of Rome began with Alba Longa, its kings, and Romulus and Remus. The narratives of Genesis, Exodus, Joshua, or Judges were repeated like the legends of Livy, as traditions containing much that is naturally impossible, but on the whole historical. The story of Sarah's maternity might be left untold, like that of Rhea Silvia's, but the wonderful escape of the infant Moses appeared more natural than that of Romulus, the capture of Jericho was recorded like that of Veii, and the regicide of Ehud like the deed of Mucius Scævola. The miraculous was reverently separated from the naturally possible, and this presented as history. Jacob migrated with his family through Canaan, though he may not have wrestled with God or an angel; Moses gave to his people laws at Sinai, no matter whether the mountain smoked or not; Joshua routed the Canaanites at Gibeon, the sun standing or moving; Samson again and again smote the Philistines, though never, perhaps, with the jaw bone of an ass. This manner of writing the early history of Israel has now become almost obsolete, though not through the powerful efforts of any single Niebuhr in this field.

Israelitish history has been slowly but completely revolutionized by the steady and progressive labor of many eminent scholars, mostly German. The discoveries of Egyptology and Assyriology have had their share in the work. Biblical criticism, an evolution of very old growth, has paved the way for critical history, which, after emancipating itself from the bondage of orthodoxy about the close of the last century, has in our time succeeded in throwing off also the shackles of literary tradition. Ewald's "Geschichte des Volkes Israel," which made its appearance more than forty years ago, marks the first great advance. But Ewald was more bold than free, more suggestive than sound; he stimulated to further work without laying foundations. Hitzig, whose smaller history with the same title (1869) followed Ewald's last edition, was freer, almost reckless, in the treatment of details, but not more independent of the traditional views concerning the composition and comparative documentary value of the Pentateuch narratives. But almost simultaneously with Hitzig's book appeared, in Holland, Kuenen's "Godsdienst van Israël," which, clearly developing

the results successively matured by Vatke, Reuss, and Graf as to the growth of Israelitish religion and legislation, presented a wholly transformed aspect of both the history and historical literature of the people. Wellhausen, in his "Geschichte Israels" (vol. i, 1878) and other writings, has carried out in grand style, and firmly established, the "Graf and Kuenen theory." Stade, in the volume before us, stands on the same basis, but goes a little beyond Wellhausen in historical and literary iconoclasm, and evinces sufficient independent research and original ingenuity to take a place among the successive leading writers on the subject. To define his standpoint is to sketch the latest stage at which Israelitish historiography, led by the strings of Biblical text criticism and archæology, has arrived in Germany and Holland. Let us hear him first as to the narrative sources of his history.

The Pentateuch was composed of original documents of widely different character. It embraces two works presenting the early legends of the people, written with the object of glorifying the national worship; two law books; and a work comprising both legend and law. Its Hebrew name, Torah (law), is derived from the book of laws discovered during the reign of King Josiah, in 621 B. C., which forms now a part of the so-called fifth book of Moses, or Deuteronomy. Its oldest original document is the historical writing of a Judæan narrator, now distinguished as the Jehovist, from the constant use of the name Jehovah. This document contains mainly mythical accounts referring to the patriarchs, Moses, and the sacred spots in Canaan. It was probably composed in the latter half of the ninth century B. C. The next in age is the work of the Ephraimitish Elohist, often called the second Elohist, from whom we have the Decalogue, and whose images of God (whom in his recitals of pre-Mosaic events he calls Elohim) are less anthropomorphic than those of the older narrator. It was written about 750 B. C. These two works were loosely woven into one, about a century and a quarter later, by a writer imbued with the spirit of the prophetic productions of the preceding periods, who may be designated as the first or pre-Deuteronomic redactor. The same (or else the later Deuteronomistic) redactor may have inserted the third component part, the so-called Book

of the Covenant (contained in Ex. xx–xxiv), a codified collection of ancient law usages, probably executed about 690 B. C. A more important component part is the Torah discovered and promulgated in 621, the Deuteronomy proper — with an historical introduction and exhortative supplements — in the spirit of which some of the older narratives were redactorially modified. The youngest part is the Priestly Codex, or the Groundwork, composed in Babylonian exile. It consists of legal enactments and narrative portions. The former, though ascribed to Mosaic revelation, were elaborated for use in the restored Jewish state and temple; the latter gave a post-exilian coloring to the patriarchal history of Israel. A later redactor — Ezra or a man of his time, about 460 B. C. — joined the Groundwork to the older historical parts, adapted the latter to the chronological plan of the former, and completed the Pentateuchal compilation.

Very similar in composition is the book of Joshua, which, in fact, forms with the Pentateuch a larger whole, now frequently designated as the Hexateuch. It contains little of the narrative of the Jehovist, has ample extracts from the (second) Elohist, shows the same Deuteronomistic varnishing, and comprises portions of the Groundwork. The Jehovist knew no Joshua as conqueror of the land west of the Jordan; the Elohist recounted this conquest under Joshua — originally an Ephraimitish hero — in imitation of the legends of Moses's conquest of the Transjordanic lands; the Groundwork fully transformed Joshua into a second Moses. A redactor later than Ezra combined all these component parts into the present book, when the Pentateuch had already obtained its canonical sanction as the Torah. The Torah alone was accepted by the Samaritans as canonical. Even additions of a later period, which are wanting in the Septuagint version, are discoverable in Joshua. The book of Judges is a still freer, unauthentic compilation. Its heroes are almost all unhistorical; they are *heroes eponymi,* legendary representatives of clans. Thus Jephthah is designated as the son of Gilead, and Gilead, like Gad, designates a tribe and its territory. What is related of his fight with the Ephraimites is an imitation of the story of Gideon. His fight with the Ammonites is told without any tangible features. The names of the Judges Ehud, Elon, Tola, and Jair appear elsewhere in lists of towns and

clans. That Ibzan and Abdon are eponymi representing clans is evident from the fact that only their places and the numbers of their children are stated. "These remarks will have proved that a period of judges preceding the period of kings cannot be spoken of seriously." There were kings, or chiefs of clans, like Gideon or Shamgar, but no judges of Israel. There was no united Israel then, and still less an Israel theoretically organized, such as the story of the struggle with Benjamin at Gibeah presents to us. This story is a *Tendenzroman,* "contradicting everything we know of Hebrew antiquities." Ruth is a post-exilian idyl, also composed for a purpose. The picture of Samuel, in the first book of that name, shows most clearly "the character of Hebrew historical tradition by its transformation of the traditional matter." In the oldest traditional form Samuel is a seer and priest of the Ephraimitish town of Ramah. Later he is brought into connection with the ancient sanctuary of Shiloh, as the true heir to the priesthood of the house of Eli. Still later he is transformed into a prophet in the style of Amos or Isaiah, who fearlessly steps before the king and declares that God likes obedience better than sacrifice. The second book of Samuel and the books of Kings contain, of course, more genuinely historical matter, but even the contents of the last-named work are "partly worthless and almost everywhere deficient." Entirely untrustworthy is Chronicles, in whatever it does not directly draw from the other books of the canon, although here and there valuable threads are woven into its tissues.

All these books, as we now have them, are thus very deceptive guides as to the earlier periods. And yet they contain a vast amount of information. To make their accounts valuable a constant application of critical operations is needed, in which the historian is guided by the light derived from Amos, Hosea, Isaiah, and other prophets, whose writings not only are true mirrors of their own times, but also clearly reflect the conditions of things in preceding ages. A few poetical fragments of older date, imbedded in the historical relations, can also be turned to good account. Every historical book, every narrative, must be analyzed and dissected into its component parts; the original text and its age, if possible, discovered; every addition, insertion, interpolation — and they are numberless — found out,

examined, and reduced to its proper value; concurrent, explanatory, or contradictory testimony compared and weighed; everything spurious fearlessly rejected. Out of the saved residue the tissue of genuine history must be rewoven. The analytical work of free criticism has been carried on with unremitting zeal, and often with corresponding ingenuity and success, for more than a century; the reconstructing process is of our own age. The minor results obtained are very numerous, much rests on plausible conjecture, and much is still covered with obscurity. The general aspect of history is changed, as we shall see.

II

The legends of Abraham, Isaac, and Jacob, our author emphatically asserts, embody no historical facts. They were local legends, separately clustering around sanctuaries of the ancient Canaanitish inhabitants of Palestine: the sanctuary of Hebron, the sacred well of Beer-sheba, and the sacred stone of Bethel. These spots were sacred before the arrival of the Israelites in the land. With the changes of the religious notions of the dwellers around, the character of the legends varied; they were modified and remodified. The Israelites — this appears almost certain — did not dwell under patriarchs in Palestine west of the Jordan, before their settlement in the lands east of that river. That they migrated into Egypt is equally improbable. Joseph is a Palestinian *heros eponymus*, the legendary representative of a tribe; his transformation into a ruler of Egypt is a work of late fiction. Even the poetical fancy which made the Israelites enter the Nile land as a family and leave it as a nation, left all the intervening time an absolute blank; the monuments know nothing whatever of the whole affair. Searching, as some Egyptologists still do, for the Pharaoh of the oppression or the traces of the exodus, is a childish amusement: nothing is to be discovered in Egypt in reference to Israelitish history. The Israelites possessed no distinct and positive historical recollections reaching back beyond the time of the settlement in western Palestine. All that was earlier recollection centred dimly in the two names Moses and Sinai. Moses had taught them at Sinai to worship Jehovah. This worship had made them a people dis-

tinguishable from other members of the Hebrew race, such as the Moabites, Ammonites, and Edomites.

The Hebrew race was kindred to the Arabs on the one side and to the Aramæans on the other. Closely akin to Israel were the Canaanites west of the Jordan and the Lebanon, including the Phœnicians. The Israelites were descended neither from a shem nor from an Eber. They were called Hebrews (*'ibrīm*) by their western Canaanitish neighbors, as dwellers beyond (*'ĕber*) the Jordan — not the Euphrates, as former explanations had it. They called themselves sons of Shem when they had become masters of the land west of the Jordan, as the nobles of the land (*shĕm* meaning name, glory, or distinction). They appear to have been originally a clan established east of the Jordan, on both sides of the Jabbok. Their *heros eponymus* was Israel, the legend of whom was subsequently blended, west of the Jordan, with the legend of Jacob, the seat of which was Bethel. The name of the clan was extended to others confederated with it, in the same way in which the appellations Latins, Alemanni, and Teutons have gained their widely comprehensive significations. The Hebrew clans which in later times constituted the nation of Israel, came into the Transjordanic region mainly from the Sinaitic peninsula; some immigration may possibly have taken place from regions bordering on the Euphrates, whence the legend of Abraham derives the whole race. As nomads of the peninsula they lived in peaceful relations with the probably Arabic tribe of the Kenites and from them — who were perhaps allies of the Midianites — they seem to have received through Moses the religion of Jehovah. It was not the religion of their ancestors, but entirely new to them. A slow migration carried them into Gilead and the adjoining districts, the Judaic clan alone probably wandering northward, with the Kenites and the Arabic Calebites, into the region west of the Dead Sea. When these migrations took place, and how long they lasted, it is impossible to tell. In Gilead the nomads, hemmed in between the Jordan and the desert, by the kindred Moabites and Ammonites on the south, and by Aramaic tribes on the north, gradually turned tillers of the soil, built cities — Mahanaim, Succoth, Jabesh, Penuel, etc. — and grew too populous for their territory. The stories of the conquest and distri-

bution of the country by Moses, of the Amorite Sihon, of Balak, and Balaam are fictions.

As the Midianites and Amalekites did in later times, the Israelites, in their nomadic state, must have made frequent plundering incursions into Western Palestine, the many fords of the upper Jordan offering easy opportunities for crossing. Peaceable transmigrations came afterward, the Israelites wedging themselves in between Canaanitish settlements, steadily gaining ground, and gradually absorbing the neighboring population. The whole history, in its more authentic features, clearly shows that there was no sudden conquest or invasion, no extermination of the natives, no deadly feud between them and the Israelites. The Hebrews, or Transjordanians, lived mostly in peace with the kindred Canaanites during the time which is generally, though erroneously, designated as the period of the judges — that is, before the union of all the tribes was effected under the monarchy. The figure of the great conqueror, Joshua, as we have seen, is the production of a late age. That no general conquest took place, and consequently no division of the conquered country, is shown by the earlier relation in the first chapter of Judges, according to which the separate tribes attempted separate conquests. That chapter, now falsely attached, as a continuation, to the book of Joshua by the words "After the death of Joshua," is evidently an extract from an extensive narrative, running parallel with that book and refuting it, which may have begun with "After the death of Moses" or "After the crossing of the Jordan." The warlike exploits spoken of in the earlier relation are, however, also far from being contemporaneous or authentic history. No such exploits, no such simultaneous movements, ever took place. The Canaanites generally held their cities, plains, and valleys, and here and there also a plateau or mountain; the Israelites mostly occupied first the intervening forest lands, which they cleared. Their peaceful advance did not exclude exceptional conquests with the sword, sudden inroads from beyond the Jordan, surprises and sacks. But these rarely effected permanent results. A part of the tribe of Dan succeeded in capturing an isolated town, Laish, in the extreme north, and establishing themselves there; Levi and Simeon treacherously surprised the Bene-Hamor of Shechem, but were

driven away and scattered by the Canaanites, and Israel, instead of helping, execrated their treachery.

Israel was the first Transjordanic Hebrew clan which gained possessions west of the river. Clan after clan followed. Living among the Canaanites, they partly blended with them. Intermarriages prevailed. The sacred places of Canaan became sanctuaries of Israel. In all other matters of culture the Israelites learned from the cities of Canaan; in the worship of Jehovah they remained faithful to their own traditions and customs. Inferior in the arts of industry, they were superior to their neighbors in religious conceptions and ethical spirit. This superiority decided the product of international blending in favor of Israel. The Israelitish element began to predominate. Moral leadership led to material rule. The rural districts were won first; the towns much later, partly by Israelitish intrusion and peaceful commingling, and partly by treaty and conquest. Severe contests for possession and sharpened religious antagonism finally created permanent animosities, and the Israelite looked down upon the Canaanite as vile and fit only to be a serf to the Sons of Shem. And yet many an Israelitish *gens* had more Canaanitish blood in it than Shemitic. The absorption of much of the native element so strengthened some of the clans, especially those which obtained much clearable land, that they grew into separate tribes. A regular division of the people into twelve tribes, however, never existed. The country was never distributed, nor did the Israelites ever possess the whole of it.

The warlike tribe of Gad was powerful in the land east of the Jordan, and, west of the river, in the earliest times, the central tribe of Joseph. The latter, after extending its possessions in a southerly direction, was divided into Benjamin, Manasseh, and Ephraim. The tribe of Judah, in the south, arose much later, forming itself out of Israelitish, Edomitish, Canaanitish, and Arabic elements. Enveloped by it were the remnants of Simeon, which, after the discomfiture at Shechem, never rose to the dignity of a tribe. The dispersion of Levi was more complete still, but its boasting of Moses as its member united its families into a kind of priestly caste, to whom the managing of the sanctuaries was generally intrusted. The priesthood was not derived originally from Aaron, who is unknown to the

earlier traditions, but from Moses, whose descendants we find figuring as priests at the northern sanctuary of the Danites. Reuben never had any political significance, almost disappearing between Gad and the powerful state of Moab, its constant enemy. Issachar, Zebulun, Naphtali, and Asher, in the north, formed a group of tribes living in small clans, closely surrounded by the Canaanitish natives, whom they were unable to assimilate or to conquer. At one time only (during the struggle with Sisera) Zebulun and Naphtali appear conspicuous in Israelitish history; Issachar and Asher never acted a noticeable part in it. That portion of Dan which remained between Judah and the Philistines was almost as powerless as Reuben between Gad and Moab. The extermination of the tribe of Benjamin is unhistorical. The chronology of the pre-monarchical times is a systematic creation of late redactors, and entirely valueless. The first attempt at founding a royalty more comprehensive than clan chiefship was made by the house of Jerubbaal in Manasseh. It proved a failure, though based on Gideon's deserts as deliverer from Midian. The greater merits of Saul as deliverer from a more general and more lasting oppression led to the establishment of the Benjamite throne, and to the union of the tribes. Samuel — who, like Eli, was a priest, and not a judge — promoted, instead of opposing, this transition from tribal anarchy to monarchical unity. With it real Israelitish history begins.

We have made no attempt to acquaint our readers with any of the critical processes which have led to the construction of the foregoing scheme of the earliest history of Israel. Those familiar to a degree with Biblical inquiry in its recent stages, even if as yet ignorant of the advances made on the basis of the Graf and Kuenen theory, which has completely changed the relative value of the main Old-Testament narratives, will neither be surprised by the results stated nor ask for explanations, which must needs transcend the bounds of a review in a journal like this. Readers who know only their Bible and apologetic commentaries, and perhaps an apologetic Bible dictionary, will, we have no doubt, be amazed at statements so often flagrantly at variance with the best-remembered texts of the Scriptures, and not a little inclined to attribute some of the assertions to defective knowledge, wrong judgment, or evil propensity on the part

of the critical innovators. Such suspicions we are unable to disarm here by evidences to the contrary, but we owe our general public the assurance that the work itself completely refutes them. Never has the minute examination and dissection of historical tradition been carried out with more painstaking earnestness, sounder knowledge, and greater freedom from religious or anti-religious prepossessions, than in the histories of Wellhausen and Stade. In the work of the latter author, which in its analysis of the traditional accounts is firmly grounded on the writings of the former, the destructive analytical labor is so convincingly justified by intrinsic evidence from the respective texts — the Hebrew as well as the Greek of the Septuagint — that only he who shuts his eyes to all evidence conflicting with cherished notions can gainsay it. Of course, we are far from saying that no point of detail can be contested. The constructive labor of the author, in which more originality is evinced, is naturally based in part on conjecture, and his conjectural facts are, we confess, often propounded with too much positiveness. It is, perhaps, owing to the frequency of instances in which hypothesis must do duty for knowledge — a frequency demanding a reiteration of acknowledged doubt too tedious to carry out — that much appears presented with an assurance not warranted by the saved remnant of dissected tradition. The plausibility of the facts or conditions constructively elicited here from a mass of conflicting testimony is generally very strong, though a most plausible guess but too often proves a mistaken guess when verification is possible.

— *Nation*, March 10 and 17, 1887.

Renan's "History of Israel" [1]

In order to complete the "History of the Origins of Christianity," which he initiated a quarter of a century ago with his "Vie de Jésus," and continued in "Les Apôtres," "Saint-Paul," "L'Antechrist," "Les Évangiles," "L'Église Chrétienne," and "Marc-Aurèle," M. Renan goes back to the early history of the nation to which the founders of the Christian

[1] *Histoire du Peuple d'Israël.* Par Ernest Renan, membre de l'Institut, professeur au Collège de France. Vol. I.

religion belonged, tracing the origins to their remote springs, "the great prophets who introduced morality into religion about 850 years before Jesus Christ." But then, "prophetism itself has its root in the antique ideal of patriarchal life, an ideal created partly by fancy, but which had been a reality in a remote part of the Israelitish tribe." Consequently Renan must begin the beginnings with the history of Hebrew patriarchal times. But is there such a history? Have any records of it been preserved? Are the Biblical Abraham, Jacob, Joseph, historical personalities? M. Renan has not the least hesitation in answering these questions with a bold negative. Abraham is a transformed recollection of a mythical Babylonian King — the good Orham, or "father Orham," Ab-Orham. Jacob and Joseph are abridged names of nomad clans, Jacob-El and Joseph-El, devoted to the worship of El, like Ishma-El and other Arab Elites. The stories told about them in Genesis are childish tales, full of miraculous traits, which readers of our time cannot but find absurd in the highest degree. Yet such is the vast learning, Biblical and Semitic in general, at the disposal of our writer, and such the magic power of his poetic fancy and descriptive diction, that he can venture to reconstruct Israel's earliest history, partly out of general observations on Arab nomad life and primitive institutions, and partly out of scanty historical threads woven by the ancient Hebrews into their myths and tales.

As we remarked on a much earlier occasion (see *Nation,* No. 213), "M. Renan, without any qualification, rejects as incredible everything supernatural; but the shadows that accompany the delineations of supernatural things he saves, and — quite as artfully as artistically — works them into new images. His new images are often excellent imitations of the sacred ones he tears; but while orthodoxy must spurn them as devoid of all sacred substance, mere unimpassioned criticism, too, can see in them little more than shadows." Thus he created his Jesus and his Apostles, and painted their Galilee and the cradle-time of Christianity, and thus he reconstructs and paints, with admirable skill, Israel in his infancy and childhood. We use this personal (and Scriptural) form of expression, for under the poetic pencil of our author the nation becomes a hero, and its

history a biographical epic. He follows Israel in his wanderings — as a child — from Arabia, along the western banks of the Euphrates, to Padan-Aram, to Canaan, into Egypt. For this period of his hero's life he has nothing but fond sympathy. Israel walks, or might have walked, in perfect simplicity and innocence; his God, then, was the homeless nomad's El, or Elohim, a benevolent, impartially just, unnational, universal god. The pictures of this life, of this faith, are impressive and beguiling from apparent naturalness of delineation and coloring. And everything is chastely done, almost to the exclusion of ornamentation, which saves the idyllically sublime from becoming ridiculous. Nor is the necessary support from varied stores of antiquarian and Oriental lore wanting to the tableau.

The reader must not hastily form the conclusion that M. Renan's epopee of Israel will be as unmixed in features as that of Jesus or St. Paul. Far from it. His Israel will become a nation in Egypt, and "alas! since the beginning of the world no amiable nation has yet been seen." Elohim will be exchanged for Yahveh (Jehovah), a special national god, a god-protector of Israel. The national idea will demand a god caring only for his nation, to the detriment, the abasement, the woe, of all its opponents and rivals. The theology of Israel, in Shiloh and Shechem, Jerusalem and Samaria, will be as black (the author does not spare the color) as it was pure and amiable under the starry skies and in the healthy air of the desert. The Jehovah of the time of the judges and early kings is not just and kind like El, "the Elyon or the Shaddai of the patriarchs." He is "shockingly partial" to Israel, "frightfully hard" to other nations. "Il tue, il ment, il trompe, il vole pour le plus grand bien d'Israël." Fortunately for the world, the development of Hebrew theology does not end there. "It will be the work of the prophets" — of the ninth century B. C., and of their successors — "to recreate the Elohism of old by dint of reflection," to perfect it, to bring their people back to it, to make it the perennial stream from which all nations will finally draw waters of bliss. "Elohim is the universal God, the God of mankind. In reality, it is to Elohim, not to Yahveh, that the world has been converted. The world has become theistic — that is, Elohistic, not Yahvistic. It has forgotten how Yah-

veh's name was pronounced; every one, to eternity, will furnish it with vowels as he fancies. Neither Christianity nor Islam knows Yahveh." This is, in fact, the keynote of the volume.

These are surely radical notions for an historian of the chosen people, a student of the origins of Christianity, who began his work, and continues it, with a kind of religious ardor. But radical and bold as all this is, the history, as such, must be pronounced far from destructively critical compared with recent German works on the same subject. Wellhausen, in his well-known sketch of the history of Israel (published in the "Britannica") wastes not a paragraph on the patriarchal period — to which our author devotes 150 pages — evidently deeming all the traditions concerning it completely valueless as a substratum for history. Stade, in his extensive work (see *Nation*, Nos. 1132 and 1133), barely alludes to them in a few lines, distinctly declaring: "Irgend eine historische Gewissheit ist bei dem bruchstückartigen dieser Ueberlieferungen und ihrer durchgängigen Versetzung mit mythologischen Elementen nicht zu gewinnen." He not only ignores all that is told about the migrations from Ur of the Chaldees to Haran through Canaan, but also the sojourn of the Israelites in Egypt, and their march under the lead of Moses to Sinai, and thence to Gilead. M. Renan has chapters on "The Beni-Israel in Egypt," on "Egypt's Influence on Israel," on "Israel's Exodus," on "Israel in the Desert of Pharan," on "Sinai," and on "The March toward Canaan," devoting much learning, some original criticism, and animated diction to particulars which the more consistent German critics reject as completely fictitious.

M. Renan's inconsistency in rejecting the bulk of the Pentateuchal narratives — all that has real historical importance — as legendary and rather idle tradition, and picking out some few slender threads, presumed to be of older texture, to weave them into a fanciful work of historical reconstruction, is flagrant. He knows no Joseph (barring the clan Joseph-El), no clearly historical Moses — "quoique son existence soit très probable" — no Aaron, no Levites, and doubts the existence of a Joshua; and yet he enters upon speculations on the route taken by the Israelites at the exodus from Egypt, imagines a substitute for the crossing of the Red Sea, speaks of Marah, Elim, Rephi-

dim, Meribah, etc., and introduces Sinai in the highest strains of descriptive rhetoric. When we examine his fascinating narratives, we find them hollow. Israel is said to have become a people in Egypt — "Israël n'est plus une tribu, c'est déjà une nation" — but a little brackish water, sweetened by the infusion of "certains branchages," keeps up this people at Marah, and seventy palm trees and some tamarisks give it shade at Elim. Of course, M. Renan reduces the millions of the fugitive Israelites to a comparatively very small number, and their forty years' wandering in the desert to a very rapid march through it — though with a senseless deviation "toward the awful wilderness" of Sinai; but in order to explain away an unavoidable residue of the miraculous, he must still resort to remarks like the following: "The fugitives might have taken along grain and provisions from Egypt. By means of the precious things which they had appropriated to themselves, if the narratives be credible, they could have procured something from the Ishmaelitish or Midianitish merchants, or form a herd for themselves. Possibly the [Sinaitic] Peninsula was not so denuded three thousand years ago as it is at present." "Might," "if," and "possibly" are poor substitutes for the wand of Moses, a surfeit of quails, and plenty of manna from heaven.

The fact is, M. Renan is a much more radical unbeliever now than he was when he wrote his "Vie de Jésus," and he is still as Bible-loving, imaginative, and artistically ambitious as he was then. Purposing to write a history of Israel without the least admixture of the supernatural, he cannot resign himself to presenting it incomplete, with gaps, and devoid of its exceptional embellishments. A disciple of the prophets and Bossuet, a critical follower of Kuenen and Wellhausen, and always poetical, he turns what he cannot accept as a sacred account and is unwilling to reject as an historical romance, into a romantic history. He begins with dissecting legend, and ends with rehabilitating it, forgetting his own maxim, "Il y a du danger à chercher trop d'histoire dans de vieux rêves où les spectres ne se distinguent pas des hommes." From the scanty footprints of the infant Israel — and to him we must limit our remarks here — a whole image of him is drawn, with the magic help of Semitic philology, Arabian archæology, Babylonian and Egyp-

tian lore, and philosophy and poetry. The interspersed remarks, learned or other — partly drawn from the author's numerous previous works and dissertations — are generally suggestive and seductively plausible. The critical details may be too numerous for the general public, but they enhance the value of the book for students. Some of the generalizations, whether sound or specious and glittering, are most forcibly presented. The following extract is, in more than one way, characteristic of the work:

"Far from advancing the religious development of Israel, Egypt only strewed obstacles and perils upon the road which God's people had to wander over. Egypt contributed the 'golden calf,' that eternal stumbling-block of the multitude; the brazen serpent, which the puritans detested; the lying oracles [Urim and Tummim]; the Levite ['ark-tender'], who became Israel's leprosy; perhaps also circumcision, the people's greatest mistake, which for a time threatened to defeat its destiny. Excepting the ark, Egypt introduced into Israel only perturbing elements, which had to be eliminated, sometimes not without a crisis. It was not thus with the notions borrowed from Chaldea. These were all fruitful, and, excepting perhaps the unpronounceable name [of the Divinity], have remained strong supports of religion. Believing mankind still lives on them, it owes to those old fables a prehistoric antiquity in which it delights, and a cosmogony of which it is proud. Israel's genius did not spring from Chaldea; but Chaldea furnished it the first ten pages of the book which has made its unparalleled success.

Egypt, on the contrary, supplied it with few fruitful germs. And how many exquisite things it killed! The beautiful Jacobelite life is gone. Those noble types of [patriarchal] aristocrats, proud, honorable, and religiously serious, have passed away. Authority rests no longer in the hands of the tribal chief. The multitude has now a voice, and this voice will not at all be in favor of religious puritanism. The Elohim-worship will soon appear dull. On every occasion the people will longingly regret the vulgarities of Egypt, and, in order to satisfy it, it will be necessary to erect for it Apis figures with gilded horns." — *Nation*, January 5, 1888.

The last article from Mr. Heilprin's pen appeared posthumously, in the *Nation* of May 31, 1888. It was as follows:

Sayce's Hibbert Lectures.[1]

The Preface to this work — one of its author's most extensive and most elaborate productions — opens with "a word of apology . . . for the numerous repetitions in the following chapters, which are due to the fact that the chapters were written and delivered in the form of lectures." The explanation is inadequate, for there are also repetitions in single divisions. In the first chapter, for instance, we read in a note to page 72:

"The name of Sin, the Moon-god, is met with in an Himyaritic inscription, and a god who thus found his way to southern Arabia would be equally likely to find his way to northern Arabia";

and again (p. 50):

"Sin was the Babylonian name of the Moon-god. We learn from a Himyaritic inscription that his name had been carried into southern Arabia, and there is therefore no reason why it should not have been imported into northern Arabia as well."

On page 45:

"Josephos has preserved an extract from the Egyptian historian, Manetho. . . . In this it is stated that the earlier name of Moses was Osarsiph, and that he had been priest of Heliopolis, or On. Here it is evident that Moses and Joseph have been confounded together. The name of Joseph, who married the daughter of the priest of On, has been decomposed into two elements, the first of which is the divine name Jeho, and this has been changed into its supposed Egyptian equivalent, Osar, or Osiris."

And in a note to page 51:

"Manetho (ap. Joseph. . . .) states that the original name of Moses was Osarsiph, and that he had been a priest of Heliopolis, or On. Osar-siph is simply Joseph, Osar or Osiris being substituted for Jeho (Jo) or Jehovah. Joseph, it will be remembered, married the daughter of the priest of On."

[1] *Lectures on the Origin and Growth of Religion*, as illustrated by the Religion of the Ancient Babylonians. By A. H. Sayce. [The Hibbert Lectures, 1887.]

Besides, another word of apology ought to have been inserted for the extensive repetitions in these "Lectures" and the appendices to them of expositions made by the author in various previous publications.

We are far from inclined to make it appear that Professor Sayce is apt to repeat himself from lack of fresh matter for new lectures or dissertations. His learning and fame shield him against such an imputation. No other archæologist is more often before the public with discoveries, or observations on discoveries, in his fields of study. And what he has to say always betokens ample familiarity with the latest research, and often ingenuity. What we object to in him, as in some of his fellow-laborers in Assyriology, is an excessive propagandist zeal in the interest of that science, from which springs an irresistible habit of inculcation. In the "Lectures" before us, everything picked out of the monumental rubbish of Babylonia and Assyria which can throw the least flicker of light, however evanescent and calculated to deceive, upon the gods and goddesses of Babylon, Borsippa, Nipur, Larsam, Eridu, etc., is pressed upon the reader with as much persuasive effort as if the salvation of Christian souls depended on a true recognition of Ea, Mullil, and Ninip, Zarpanit, Davkina, and Ninkigal, and their like. And a very large part of what is thus offered as knowledge of a high order — though not without reservations as to entire accuracy, made in view of daily fresh light — rests, in reality, on a frail network of conjecture. The conjectures are surely of interest to the scholar, and worth the trouble of examination — as are the problems of Etruscan or Basque etymology — but they should be dealt with as topics for the learned, without missionary ardor. The subject, on the whole, is not worthy of enthusiasm; for Chaldean mythology, as revealed to us by the pedant scribblers on clay tablets, is as completely devoid of poetic charm and primitive naïveté as the Assyro-Babylonian history of the monuments is devoid of all traits of nobility or naturalness.

A study of "the religion of the ancient Babylonians" is, it is true, not without interest in regard to Biblical inquiry. It imparts to us, for instance, information about Nebo, Merodach, Bel, Babylonian divinities mentioned in the Old Testament —

the first in Isaiah, the second in Jeremiah, and the third in both. But how much does that new information amount to? Before cuneiform decipherments had been made, we believed with Gesenius that the gods mentioned were divine embodiments of the planets Mercury, Mars, and Jupiter, respectively. Now we have learned that "Nebo must have once been an elemental god," that "Babylonian astronomy made him the presiding deity of the planet Mercury, just as it made Merodach the presiding deity of Jupiter," and that "the Merodach of the historical age" was "the great Bel or Baal of Babylon," though different from "the older Bel of Nipur." According to this, Gesenius was right when he identified Nebo with Mercury, and Bel with Jupiter, and mistaken in regard to Merodach, in not identifying him with the great Bel of Babylon, but deriving his name, which, in Jeremiah (1, 2), is coupled with Bel's, as Nebo's is in Isaiah (xlvi, 1), "a stirpe *Mord, Mort,* quæ et *mortem* et *cædem* significat," just as "*Mars, Mavors,* et *mors* ejusdem originis esse videntur" ("Thesaurus," *s. v.*). And the gain is a different meaning, without a new rendering, for a line in Jeremiah. Whether King Merodach-Baladan or King Evil-Merodach bore the name of Jupiter or Mars, is, of course, wholly indifferent.

Incomparably more important to Biblical students would be the remarks concerning the names of Joseph, Moses, Saul, David, and Solomon, if they were sufficiently substantiated. Collectively they would greatly impair the value of the Scriptural narratives of all early Hebrew history, even if considered merely as reflections of popular tradition. The story of Joseph would cease to be a recollection of Egyptian life, and become something like a Babylonian myth — because it appears "probable that the name of Joseph was originally identical with the Babylonian *asipu,*" which may be the designation of "the god of the oracle," especially as among the names of the cities captured by Thothmes III., in Palestine, there is one which is read *Iseph-el,* and may be translated "Joseph, the God." The name Moses would be a reminiscence of the Babylonian *masu,* "the hero" or "leader," "an epithet applied to more than *one* divinity," but "in a peculiar sense associated with the sun-god" — the character which represented the idea of hero also

representing "the idea of a 'collection of books,' . . . 'a scribe' or 'librarian,'" terms so appropriate to the lawgiver "to whom Hebrew tradition referred the collection of its earliest documents, and the compilation of its legal code." Besides, Moses was said to have died on Mount Nebo, which bore the name of "the prophet-god of Babylon, . . . the patron of writing and literature," as a star "accounted one of the seven 'heroes' or *māsu*"; and in the story of him we also meet with the name Sin, which was that of another Babylonian god, and "Sinai itself," which Moses reached after traversing the wilderness of Sin, "can scarcely signify anything else than the mountain sacred to the Moon-god." Saul and Solomon also bear the names of Assyro-Babylonian gods, popularly bestowed on them instead of their original names. For the former, "the one asked for" (Heb. Shāūl), the people wisely discovered the "singularly appropriate" mythological name Savul, or Sawul, by which the sun-god was known at Babylon, whence if "Rehoboth of the river" designates that city, the Edomites also received a King Saul (Gen. xxxvi). The successor of David they named after Sallimanu, "the god of peace," probably a fish-god, "honored particularly in Assyria," in a list of whose gods "mention is made of 'Sallimanu the fish, the god of the city of Temen-Sallim (the foundation of peace)'" — so strikingly reminding one of Solomon of Jerusalem.

The argument as to the name of the son of Jesse is fuller. Condensed, it runs thus: "That David's first name was Elhanan (or Baal-hanan) has long been suspected, since it is stated in one passage that Elhanan, the son of a Bethlehemite, 'slew Goliah the Gittite, the staff of whose spear was like a weaver's beam,' while the feat is elsewhere ascribed to David; and at the head of the thirty mighty men of David is placed Elhanan, the son of Dodo of Bethlehem, where we should probably read 'Elhanan, who is Dodo,' or David." This name is identical with that of the Syrian supreme Baal, or Sun-god, Hadad. In an abbreviated form, Shalmaneser speaks of the god Dáda of Khalman, or Aleppo. Be-dad, or Ben-dad, "the son of Dad," was the father of the Edomite, Hadad. David, "or Dod, as the word ought to be read," or Dodo — "the beloved one" —

is the male corresponding to the Phœnician goddess and presiding deity of Carthage, called Dido by the writers of Rome. And a recent thorough examination of the squeeze of the Moabite stone by Professors Socin and Smend, which resulted in some new readings, shows that King Mesha "tells us that he had carried away from Ataroth 'the *arel* (or altar) of Dodo and dragged it before Chemoth,' and from Nebo 'the *arels* (or altars) of Yahveh,' which he likewise 'dragged before Chamoth.'" From this parallelism "it is quite clear" "that the Israelites of the northern kingdom worshipped a Dodo or Dod by the side of Yahveh, or, rather, that they adored the supreme God under the name of Dodo as well as under that of Yahveh." It is even "suggested that Dod, or Dodo, was an old title of the supreme God in the Jebusite Jerusalem, and that hence Isaiah, when describing Jerusalem as the tower of the vineyard the Lord had planted in Israel, calls him Dôd-î, 'my beloved.'"

To us "it is quite clear" that all these identifications, however specious some of them may appear, are extravagantly forced. Let us examine them briefly. Professor Sayce himself evidently knows only an epithet *asipu*, but no such name *of* a god, for a mention of which we have in vain searched the books (on our shelves) of Schrader, Delitzsch, Hommel, George Smith, Lenormant, the Oxford professor himself, and other Assyriologists. The city name read by our author Iseph-el, and translated "Joseph, the God," is read by Brugsch, the best authority on the subject, Ishpar, and identified with Micah's Shaphir. Nor have we been able to discover a trace of a god Māsu, into which the epithet *māsu* is twisted, or of Savul, or Sawul. Now we should have to believe that the Hebrews of those olden times were wonderfully learned in the mythological lore of Babylon and Nineveh, with which, as the Bible and the monuments concurrently show, they had not the least connection in those periods, if we were to assume that such recondite and obscure designations could have any popular meaning for them, as substitute names for their heroes. If surnames like "the one asked for," "the beloved one," or "the peaceable" were assumed, or bestowed on kings — as the Egyptian Ptolemies were called Soter, Philadelphus, Euergetes, etc. — the purely Hebrew appellations Shāūl, Dāvīd (or, say Dōd), Sh'lōmōh, were excel-

lently chosen, and there was surely no need for the names of foreign idols. Nor were the Israelites in the habit of bestowing on a man the simple name of a divinity. They would couple with that name — Jah (or Jehovah), El, Baal — a verb or a common noun, thus: Jedediah, Jehovah's favorite; Elkanah, God-made; Jerubbaal, Baal-fighter. The list of the thirty mighty men of David which is cited to prove the identity of that King's name with Hadad and Dada, contains nine such compound names — Asael, Elhanan, Elika, Eliahba, Jonathan, Eliphalet, Eliam, Uriah (besides the incidentally mentioned Joab and Zeruiah) — and no name of a foreign god. "That David's first name was Elhanan has long been suspected," is true, but the conjecture has just as long been considered easily refutable by the texts (II. Sam. xxi and xxiii) on which it was grounded. Thenius ("Die Bücher Samuels") showed its hollowness, Wellhausen ("Der Text der Bücher Samuelis") completely ignored it. And the supposition that "the Israelites of the northern kingdom worshipped a Dodo or Dod" — not the least allusion to which can be found in the Bible — is extremely far from being made "quite clear" by Socin and Smend's examination of the squeeze of Mesha's inscription. These professors themselves, in their joint monograph on the subject ("Die Inschrift des Königs Mesa von Moab für akademische Vorlesungen," 1886), say: "Allerdings könnte man in Dodo . . . vielleicht ebenso gut den Namen des Stifters wie den einer Gottheit (Liebesgottheit?) suchen." That is to say, Mesha's "Dodo" — if correctly read — may designate a man, and, if a divinity, a goddess of love — the Dido of the Phœnicians. (What an appropriate name for King David!) Besides, the *arel* in question was "deutlich Moabitischen Ursprungs," carried as "spolia opima" to the border-town Ataroth, and back to Moab by Mesha. On so frail a basis is reared the hypothesis that the Israelites "adored the supreme God under the name of Dodo, as well as under that of Yahveh," and that even Isaiah spoke of the Lord as Dod!

After all this evidence of the learned author's fondness for bold conjectures, it is hardly necessary to state that his faith in the extravagant speculations of "the brilliant and gifted François Lenormant," of "Dr. Fritz Hommel, one of the ablest

of the younger band of Assyrian students," and others, as to the relations of Accado-Sumerian to Semitic Babylonian and of Accadian and Sumerian to each other, has not been shaken in the least by the more than half accomplished desertion of Friedrich Delitzsch to the side of Halévy, who knows only Semitic-Babylonian inscriptions. We will conclude our notice of the "Lectures" with an extract showing the author's offensive-defensive attitude in this question:

"Far be it from me to disparage . . . the work which has been accomplished by Professor Delitzsch and his pupils. We owe it in great measure to him that the decipherment of Assyrian stands at its present level of scholarship. . . . But the Leipzig school has, with one or two striking exceptions, been far too one-sided. Archæology, history, religion, mythology, have been neglected in favor of the almost exclusive study of words: words, too, not as bound together in the sentences of untranslated texts, but isolated and apart. . . . This excessive devotion to vocabularies has been too often accompanied by a misconception or forgetfulness of the real nature of the 'bilingual lists.' They are for the most part commentaries upon older texts, made we know not when, and intended to explain the meaning of rare or obsolete words, ideographs, and expressions. The original text was sometimes in Accado-Sumerian, sometimes in an older form of Semitic Babylonian, while at other times texts in both languages were commented on together by the scribe. In the so-called non-Semitic column of the 'bilingual lists,' accordingly, we must expect to find not only Accado-Sumerian, but also Semitic words as well as ideographs, which may be either of Sumerian or of Semitic origin. . . . The mythological lists, which contain a medley of divine names and epithets drawn from sources of all kinds and ages, partly Accado-Sumerian, partly Assyrian, partly purely ideographic, partly even Elamite or Kossæan, afford a good example of the difficulty and danger of trusting implicitly to such guides. It is from this cause that Assyrian has been taken for Accadian, Accadian for Assyrian; while ideographs have been read phonetically, and phonetic characters as if they were ideographs."

VIII

RECOLLECTIONS OF HUNGARY AND POLAND

Many hundred pages might have been added to the foregoing extracts from the *Nation* without heightening the wonder at such varied and profound scholarship. Whatever Mr. Helprin wrote was characteristic of him. His ideal truthfulness was stamped upon every line. "He wished to be absolutely just," the editors of the *Nation* wrote of him, and to this striving for accuracy he was quite willing to sacrifice, at times, a literary effectiveness well within his grasp. In reviewing a book, or writing an editorial on men and measures, he would often qualify an opinion just expressed, raise a doubt concerning seeming facts, ask a series of questions to which he himself had no answer — all of which occasionally impaired the force of his diction; but when its flow was unimpeded it carried the reader with it by its pure literary charm.

Were it possible to follow all the incidents of this life, from childhood to old age, we should have before us a picture of a singularly harmonious and consistently winning personality. There was not a flaw in Michael Heilprin's character, not a single trait one could have wished different. From the time I first met him, in the winter of 1866, to the day of his death, in May, 1888, I had daily opportunity of knowing and admiring the loveliness of his nature. He was ever stimulating and ennobling to all who came in contact with him.

It is not possible to construct, from the scanty material at my disposal, even if supplemented by the recollections of his still surviving daughters, a consecutive story of Mr. Heilprin's life. He sometimes spoke, in his last years, of writing down his reminiscences, but it would not have been easy for him to do justice to his career. His modesty in speaking of his own achievements and the absence of letters from those, in various countries, who had known and written to him, would I think have interfered with his plan. Though of methodical and orderly habits, he

rarely preserved a letter, and for the last twenty years kept no record of what he wrote. Only a few of his articles in the *Nation* (and these only from among the earliest) were found in the two meagre scrap books which contain some of his literary records. It was a pleasant surprise to me to find a thin little volume of 62 pages bearing on the cover the dedication *Kedves Nömnek. Budavár viszavétele napján* (To my dear wife. On the anniversary of the recapture of Buda), which contains the poems he wrote during the Hungarian revolution, including a few translations and adaptations from the German and French. The fly-leaf shows the written date "1849." Otherwise there is no indication of the author or the time and place of publication. In all likelihood the poems were surreptitiously printed, and it would have been, at that time, a matter of the greatest personal danger to disclose the name of the author. One of these poems, "Kaszához ki magyar," (To the Scythe, Hungarians!) credited to "H. M." (Heilprin Mihály, as the name is written in Hungarian) is found in an anthology of revolutionary poems in the possession of the family, likewise without date or place of publication or name of editor. The collection bears the title of *Hangok a Múltbol* (Echoes from the Past).

Hungarian poetry had a firm place in Mr. Heilprin's heart. Perhaps no poet in any language was as dear to him as Alexander Petöfi, the greatest of Magyar bards, some of whose lyrics he translated into English. I quote two of these translations, which were printed in *Graham's Magazine*, in 1857.

My Care

One care torments my heart — should I
One day in bed, on cushions die!
Die drooping, like a faded flower,
Whose roots the gnawing worms devour;
Or slow consumed in growing gloom,
A candle left in empty room!
Oh God! not such a death may be,
Not such, the end of life to me!
I 'd die — a tree that lightnings break,
Or tempests wild, when forests shake;

A rock, by crushing thunder's might
Dashed to the vale from craggy height.
When once the nations, tired to bear,
To break the yoke of slavery dare,
And rise at once with brandished swords,
And banners red, and with these words
Upon the banners all unfurled:
"Freedom forever to the world!"
That sound from east to western ends —
And tyranny to fight descends,
There flow my blood
In battle dread —
Fresh out of my exulting breast.
May there my dying voice — suppress
By weapons' clink, unheard expire
'Mid trumpets' sounds and cannons' fire —
And o'er my corse
The snorting horse
May dashing run to victory,
And leave unburied, trampled, me.
My scattered bones they 'll gather there
When burial's day comes grand and fair;
When with the mournful music's sound,
And under banners furled around,
They lay in one grave, side by side,
All who for thee, World's Freedom! died.

My Songs

In musing thoughts I often stray:
I dream — what? I could hardly say,
And thus throughout my home I fly,
All o'er the earth and through the sky.
The little songs I then unroll
Are moonbeams of my dreaming soul.

While thus I rove in realms of air,
I ought perhaps for wants to care,
To think — oh, that 's too serious!
There is a God who thinks for us.
The little songs I then enroll
Are butterfiies of my light soul.

HEILPRIN

len fair,
ink my care;
e as far
ths the star.
unroll
soul.

of glee,
mfort be,
d wine I find,
es o'er my mind.
unroll
sy soul.

ands around,
h chains are bound;
charm the ear,
chains to hear.
unroll
tful soul.

bonds remain?
k the chain,
h heav'n, it must
destroyed by rust?
unroll
angry soul.

one day entered Mr. Heilprin's
me of his songs, and laughingly
lling well. The poet's wish to
ere unknown, was literally ful-
of Segesvár (Schässburg), July
d of afterwards. It is thought
e, and that his body, mangled
in an unknown grave.

s bearing on his early life in
mand of the Polish language,
ything in it. Though he loved
ildhood, of the woods near his
f some favorite book he read in

his young days, he was comparatively reticent concerning his experiences in Poland. Of his father, whose life will be sketched at the close of this volume, he always spoke in terms of veneration. From him he derived his first scholarly impulses. The language of the home in Poland was German as well as Polish. Latin and Greek he acquired early, though the study of Hebrew was paramount to everything else. When little more than a child, he began to write down critical remarks on certain passages of the Old Testament. Of the value of these random annotations, partly linguistic, partly historical, I shall speak later on. He accompanied his father on some journeys to Prussia and Austria, in the course of which he came in contact with interesting persons. He repeatedly saw, among other Hebraists, the great rabbinical critic Rapoport. Abraham Geiger, the distinguished liberal theologian, he met later on, as he did the eminent botanist, Pringsheim.

Though the family enjoyed in their home the esteem alike of Christians and Jews, the political conditions of Poland rested heavily on them, and they were glad to breathe the freer air of Hungary, to which country they emigrated in 1842. A few remarks may be added to Mr. Chadwick's statements concerning their life in Hungary. Michael Heilprin's speedily acquired mastery of the Hungarian language and his general accomplishments procured him the acquaintance of men prominent in national life. Kossuth, I believe, he did not meet until after the Revolution, but he became attached to Szemere, the Minister of the Interior in 1848, from whom he accepted a place in the literary bureau of that department. He also became well acquainted with the statesman Csengery, known for his historical writings and his translation of Macaulay's *History of England*. After the struggles of 1848 Mr. Heilprin thought it prudent to leave Miskolcz, where the family had settled on coming from Poland, and betake himself with his family to Pesth, and he was present with them at the siege of Buda, in the spring of 1849. The final collapse of the revolutionary movement rendered his stay in Hungary insecure, and he repaired, in 1850, to Paris, where he spent a few months, troubled by his failing eyesight and anxiety for his family, who had remained in Hungary. He found, however, wholesome diversion in rambles

along the Loire, in the company of a prominent Hungarian refugee, Mr. Ludvigh, whose son subsequently became much attached to the Heilprin family in New York. While in France he formed the resolution to become a vegetarian, to which he adhered to the end of his life.

IX

MR. HEILPRIN'S FIRST YEARS IN AMERICA

Mr. Chadwick's sketch omits mention of Philadelphia, as the first home of the family in America. They arrived in that city in May, 1856. Mr. Heilprin gained there a precarious livelihood by teaching until, two years later, he secured work on Appleton's Cyclopædia. His interest in American politics began with the day of his arrival on American soil, as is shown by a striking incident which occurred a few months after. A well-informed writer, in an essay on Mr. Heilprin, published in the *Jewish Exponent* of October 27, 1899, described this incident as follows:

"Toward the end of the fifties, when public opinion was crystallizing on the impending war issue, Philadelphia was the scene of a conflict whose bitterness can better be imagined than described. Party feelings had reached the boiling-point when, one evening, Carpenter's Hall was appropriated for the use of the anti-slavery Democrats. The speaker on this occasion, all enthusiastic, was convincing his audience of the justice of their cause when he was suddenly interrupted by the hoots and jeers of a crowd of hoodlums representing the 'Copperheads,' who entirely unobserved had entered the meeting. Quick as a flash, in this moment of uproar, an unknown man rose from one of the first rows in the audience. Every eye was upon him. In breathless excitement he mounted his chair, and in vigorous German, reinforced by a remarkable eloquence, delivered such a bitter tirade against the methods of the opposition as to make him at once the object of the mob's resentment. He was immediately surrounded . . . and was about to be rushed bodily out of the hall when Dr. Edward Morwitz organized his friends upon the platform . . . and succeeded in tearing him away from the clutches of the angry mob. That man, that hero in the conflict for truth and justice, was Michael Heilprin."

Four years later, in a burning denunciation of the pro-slavery arguments of a well-known Jewish rabbi, published in the New York *Tribune,* Mr. Heilprin showed himself as fully at home in the intricacies of American politics as in biblical lore. Referring to his antagonist's preference for the translation "slave" of the Hebrew word, *ebed,* instead of "servant" as used in the English version, he wrote:

"It would certainly be no less a task to make the great lights of biblical criticism and theology agree upon a harmonious translation of it in all passages, than to bring about a similar harmony regarding the construction of the United States Constitution in all its parts, between Senators Seward and Bigler, Wade and Iverson, Sumner and Davis, Wilson and Toombs," etc.

Mr. Heilprin found it inconvenient to remain in Philadelphia, owing to his work on the Cyclopædia, and the family moved to Brooklyn in August, 1858.

It was there that the acquaintance with the Manning family ripened into the warmest friendship. Mr. and Mrs. Manning had long cherished the greatest admiration for Mr. Heilprin. Mrs. Manning, who was during the war prominently connected with the Sanitary Commission, awakened in President Lincoln a desire (as she related it) to meet her "remarkable friend." In Brooklyn, as later on in New York, there lived quite a number of Hungarian patriots of the year 1848, who found their way naturally to Mr. Heilprin's house. The members of the Kossuth family, who had found a refuge in America, his sisters, Mme. Kossuth-Zulavsky, and Mme. Ruttkay, and their children were often welcome guests under the Heilprin roof, and the friendship lasted until and beyond Mme. Ruttkay's final return to Hungary. From Mme. Ruttkay, who, like most of the members of the family, had something of Kossuth's fiery eloquence, Mr. Heilprin had occasional reports concerning her distinguished brother. Among other Hungarians who visited the house was Mr. Zagonyi, who afterwards became a colonel in the Union army and achieved distinction as a cavalry officer under Frémont, at the battle of Springfield. Mr. Heilprin met also Generals Stahel and Asboth, both Hungarians by birth, and knew Ujházy, a resident of Texas, who bore the title of Governor, from having been in

command of one of the Hungarian fortresses during the Revolution.

The friendship of the Heilprins for Mme. Zulavsky, who was tenderly cared for by the Mannings, brightened many hours of her last illness, and when she died Mr. Heilprin spoke feelingly at her grave in Greenwood Cemetery, Brooklyn, July 1, 1860.

It was at that time, in July, 1860, that a number of Hungarian patriots in America, among them Ladislas Zulavski, organized a legion to join Garibaldi in his rising against Sicily. At a banquet on the eve of their departure Mr. Heilprin bade them godspeed in a stirring poem, three stanzas of which read:

And when the roaring tempest shakes
Your vessel's mast and rib and keel,
Then sing ye loud through storm and waves
Your Vörösmarty's grand "Appeal"!
That ocean's waves, reëchoing,
May thunder it to ev'ry shore —
That Arpád's nation is not dead,
That Hungary will live once more!

For Europe's Freedom now revives —
She struggles now to burst her tomb;
Behold her mártyrs' spectres rise!
They come to tell the despots' doom.
And ancient glories are renewed,
And Spartan, Roman deeds are done;
Behold, alive the sacred band,
Camillus, and Timoleon!

'T is he, 't is he, Timoleon!
His galleys boldly part the waves —
The Pæan sounds, the tempest yields —
Now rise, young Dionysius' slaves!
The west cape hails, Panormus shouts,
At Ætna's foot Catania shakes;
The island's tyrant trembling sits
Upon his throne, the while it breaks.

X

CONTRIBUTIONS TO THE AMERICAN CYCLOPÆDIA

Mr. Heilprin's connection with the Cyclopædia, begun in 1858, lasted until its completion, at the end of 1862. In addition to his critical revision of the writings of others, he contributed a vast number of articles himself. I find among his papers, in his own handwriting, a "Partial List of M. Heilprin's contributions to the *New American Cyclopædia*." The list is as follows:

Greece — Epirus, Macedonia, Delphi, Delos, Laconia, Messenia, Epaminondas, Cleomenes, Demetrius Phalereus, Demetrius Poliorcetes, Canaris, Mavrocordato.

Italy, Roman Empire — Etruria, Genoa, Coriolanus, Catiline, Cassius, Domitian, Justinian, Dictator, Emperor, Freedmen, Fasti, Circus.

France — Gaul, Franks, Merovingians, Fronde, Directory, Francis II., Crillon, Gourgaud, Louis XVIII.

Germany — Moravia, Hohenstaufen, Hapsburg, Hohenzollern, Frederic II., Louis IV., Frederic III., Maximilian I., Leopold I., Joseph I., Charles VII., Maria Theresa, Joseph II., Leopold II., Francis II., Francis Joseph of Austria, Frederic I. of Prussia, Frederic William II., Frederic William III., Frederic William IV., Frederic III of Saxony, Frederic Augustus I., Frederic Augustus II., Frederic I. of Würtemberg, Kaunitz, Gneisenau, Gyulai.

Holland — Maurice of Nassau.

Hungary — Hungary (including language and literature), Pannonia, Military Frontier, Pesth, Debreczin, Hunyady, Kossuth, Görgey, Klapka, Guyon, Kmety, Perczel, Kazinczky, Kisfaludy, Petöfi, Csoma, Kollar.

Poland — Poland (including language and literature), Lithuania, Galicia, Cracow, Casimir the Great, John Sobieski, Chmielnicki, Czarniecki, Czartoryski, Lelewel, Chlopicki, Chlapowski, Chrzanowski, Dembinski, Mickiewicz, Mieroslawski.

Russia — Cronstadt, Kiev, Dnieper, Dniester, Fedor I., Demetrius, Catharine I., Catharine II., Elizabeth, Constantine Pavlovitch, Constantine Nicolaevitch Diebitsch, Paskevitch, Dolgoruki, Demidoff, Mentchikoff, Gallitzin, Gortchakoff, Karamsin, Czar, Cossacks.

Servia — Czerny George, Obrenovitch, Karajitch.

Danubian Principalities — Moldavia.

Asia — Hebrews (including language and literature), Judæa, Chaldea, Media, Gilead, Gaza, Canticles, Esdras, Books of, Ezra, Esther, Hillel, (Maimonides) Cyrus, Darius, Chosroes, Genghis-Khan, Hariri, Lydia, Lycia.

Africa — Cush, Elephantine, Cyrenæa, Cyrene, Ethiopia, Ethiopian Language, Numidia, Hamilcar, Hasdrubal, Hannibal, Masinissa, Genseric.

Many of these articles were retained, wholly or in part, in the subsequent edition of the Cyclopædia.

The most notable of these, "Hebrews," covers twenty pages of the Cyclopædia. It is a brilliant production, and as an epitome of the history and the achievements of the Jewish race can hardly be surpassed. The article embodies Mr. Heilprin's deliberate judgment in choosing for mention names of those Jews who most worthily illustrated the achievements of the race, and the lists, interspersed throughout the article, are probably more nearly representative than any others that have ever appeared in any encyclopædia. It must be remembered that the article was written about 1859. As a specimen of its wealth of learning and of the general treatment of the subject I quote from the article the following:

"The political and intellectual condition of the Jews was worse in the Byzantine empire and in the feudal states which arose on the ruins of the western. Deprived of most civil rights, they were now and then bloodily persecuted, as by the Franks and Visigoths in the 6th and 7th centuries, by the Byzantines in the 8th, when many of them fled and even spread their religion among the Khazars about the Caspian sea, and again in the 11th, about which time they appear in Russia, though only for a short time, and in Hungary. More tolerable, however, was their situation in Italy, Sicily, and Sardinia, where they often found protection through the influence of the popes. Bari and Otranto became the principal seats of Jewish learning.

The renowned Eleazer ben Kalir and other writers of *piyutim* (liturgical songs in Hebrew rhymed verse), the historian Josipon, and the astronomer Shabthay Donolo, flourished in Italy in the 9th and 10th centuries, and the lexicographer Nathan in the 11th. From Italy science spread to the cities on the Rhine, to Lorraine and France. In the 11th and 12th centuries we find in Germany Simeon, the author of the talmudical *Yalkut* ('Gleaning Bag'), the poet Samuel the Pious, and the writer of travels Petahiah; in northern France, Gerson, surnamed the 'light of the exiled,' the liturgical poet Joseph Tob Elem, the renowned commentators Solomon Isaaki and his grandson Solomon ben Meir, and the authors of the talmudical Tosafoth ('Additions'), Isaac ben Asher, Jacob ben Meir, &c. Spain, after the conquest by the Saracens, who carried thither culture, science, and poetry, was destined to develop the most prosperous and flourishing condition which the Jews enjoyed in the Middle Ages. Persecutions became rare and exceptional. The Jews enjoyed civil rights and rose to high dignities in the state under the Moorish princes, and were almost as well treated by the Christian monarchs, and their culture and progress in science not only kept pace with their prosperity, but also outlived occasional adversity. In the 10th century we see there the lexicographer Menahem, the astronomer Hassan, and the rich, liberal, and scientific Hasdai, the friend and physician of the caliph Abderrahman III., at Cordova; in the 11th the talmudical scholars Samuel Hallevi and Isaac Alfasi (of Fez), the grammarian Abulwalid, the philosopher David Mokamez, the ethical writer Behay, and Solomon ben Gabirol, equally celebrated as Hebrew poet and Arabic philosopher; in the 12th the theologian Abraham ben David, the astronomer and geographer Abraham ben Hiya, the poet Moses ben Ezra, the traveller Benjamin of Tudela, the scientific poet Jehudah Hallevi, whose glowing songs rival the beauties and purity of the Psalms, the great critic, philosopher, and poet Aben Ezra, and finally Moses Maimonides, who as philosopher, as well as writer on the law, by far surpassed all his contemporaries. The diffusion of science among the Jews now attained its height in Europe, as well as in Egypt, whither Maimonides fled after a persecution at Cordova (1157), and

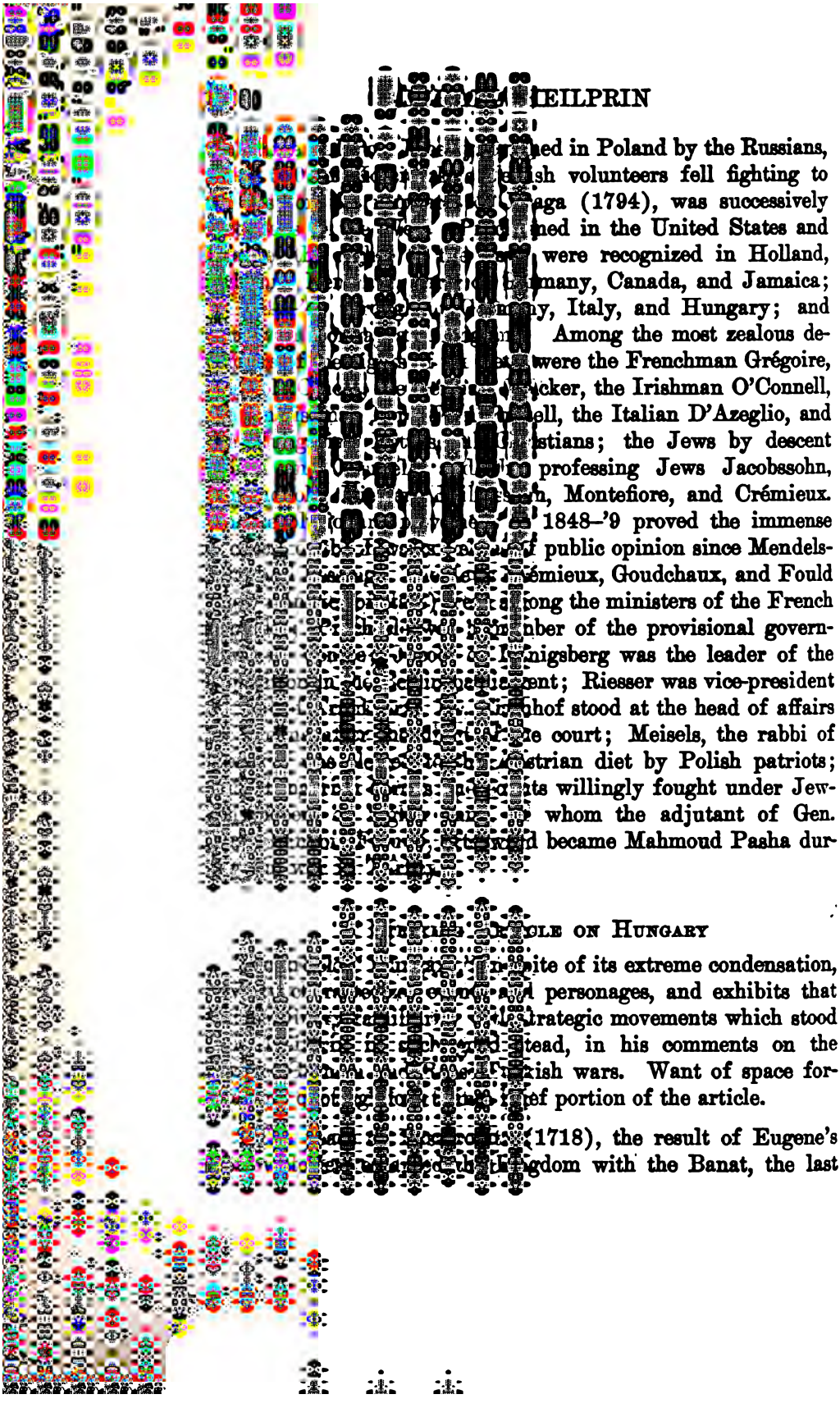
where he and his son Abraham officiated as physicians to the court of the sultan. Spain numbered among its vast number of scholars in the 13th, 14th, and 15th centuries, the poets Charizi, the Hebrew imitator of the Arabian Hariri, and Sahola; the astronomers Aben Sid, the author of the Alfonsine tables, Ieraeli, and Alhadev; the philosophical theologians Palquera, Lattef, Caspi, Hasdai, Albo, and Shemtob; the celebrated commentators Nahmanides, Addereth, Gerundi, Behay, Yomtob, and Nissim; the cabalists Todros, Gecatilia, Abelafia, and De Leon. In Provence and Languedoc, where high schools flourished in Lunel, Nîmes, Narbonne, Montpellier, and Marseilles, from the 12th to the 15th century, we find the three grammarians Kimhi and their follower Ephodi; the poets Ezobi, Jedaiah, and Calonymus; the commentators Zerahiah Hallevi, Abraham ben David, and Menahem ben Solomon; the philosophers Levi ben Abraham, Levi ben Gerson, and Vidal; the four Tibbons, all translators from Arabic into Hebrew, and the lexicographer Isaac Nathan. Italy had in the 13th, 14th, and 15th centuries the poets Immanuel, an imitator of Dante, Moses de Rieti, and Messir Leon; the talmudists Trani and Colon; the cabalist Recanate; the astronomer Immanuel; various grammarians and translators from Arabic and Latin; and finally the philosopher Elias del Medigo. Germany had in the same period the talmudists Meir, Mordecai, Asher and his son Jacob, and Isserlin, the cabalist Eleazar, and others. The Caraites, too, had a number of scholars, as Hadassi, the two Aarons, and others. During the early part of this long period of literary activity in the West the Jews enjoyed peace and prosperity, with various interruptions, in Spain, Portugal, Italy, Greece, the islands of the Mediterranean, in Hungary, especially under the national kings, and in Poland, which hospitably received the numerous exiles from all neighboring countries, under the Piasts, particularly the last of them, Casimir the Great; but there were none in Muscovy and in the Scandinavian states; and in England, where they appear before the time of Alfred, in France, where only the early Carlovingians, and especially Charlemagne, favored them, and throughout Germany, their condition was in the last degree deplorable. Circumscribed in their rights by decrees and laws of the ecclesi-

cluded from all honorable occu-
lace, from province to province,
elusively by mercantile occupa-
degraded in the cities, kept in
their dress with signs of con-
rons and penniless princes, an
he civil feuds, again and again
ims, owned and sold as serfs
erors, butchered by mobs and
e monks, burned in thousands
d their brethren of Jerusalem in
ridicule, abusive sermons, mon-
hreats and experiments of con-
antries offer in their mediæval
rrors and gloom. In England
e reigns of Richard I., at whose
dly massacred at York (1189),
ird I., who expelled them alto-
. From France they were for
harles VI. (1395). Germany,
evailed, was the scene of their
frightful of which took place in
the great desolation by the black
rope from the Volga to the At-
t to the ignorant people as hav-
isoning the wells, the Jews were
public squares, or burned them-
synagogues. Almost every im-
ecution of the Jews. The Swiss
s, almost all banishing their
ence of the inquisition the Jews
ered the same fate. The pro-
radually withdrawn, they were
y into separate quarters (*ghetti*),
e badges; persecutions became
e Jews of Sicily, about 20,000
Spain, during a long drought in
s were massacred in many cities.
worse in the following century,

until their extirpation from the whole country was determined upon, and, after repeated but fruitless attempts at conversion by the stake, finally carried into effect by Ferdinand and Isabella (1492). More than 70,000 families sought refuge in Portugal, where for a large sum of money the fugitives were allowed to remain for a few months, in Africa, Italy, Turkey, and other countries. Not the fifth part of them survived the horrors of compulsory expatriation, shipwreck, and subsequent famine. The feeling observer may find a compensation in the fact that while these events happened propitious winds carried three small caravels across the Atlantic to a new world, whose enervating treasures were destined to assist the inquisition in undermining the power of the oppressors, and whose future institutions were to inaugurate an era of freedom to the descendants of the oppressed. The Jews of Portugal were banished soon after (1495) by King Emmanuel, being robbed of their children under fourteen years of age, who were sent to distant islands to be brought up as Christians. The numerous converted Jews of the peninsula and their descendants were still persecuted for more than two centuries by governments, inquisitors, and mobs. These persecutions, which eventually carried the bulk of the European Jewish population into the province of Poland and Turkey, similar events in the East during the crusades, a long series of persecutions in Germany, and in central and southern Italy in the 16th century, and bloody massacres by the revolted Cossacks under Chmielnicki in the S. E. regions of Poland, together with a general and minutely developed system of petty oppression, extortion, and degradation, to which the Jews were subjected in most parts of Europe during the 250 years following their expulsion from the Iberian peninsula, could not but exercise a disastrous influence upon the culture and literature of the people. The spirit of cheerful inquiry, study, and poetry which distinguished the Spanish-Provençal period, was gone. The critical knowledge and use of the Hebrew was neglected, the study of the Talmud and its commentaries became the almost exclusive occupation of the literary youth, and cabalistic speculations replaced philosophy, producing in Poland various schools of religious enthusiasts called, *Hasidim* (pietists). A bold Turkish Jew, Shabthay Tzebi,

who, like the Persian Aldaud or Alroy in the 12th century, was proclaimed by his cabalistic followers the expected Messiah of Israel, found numerous adherents in various parts of Europe (1666), whose delusion was destroyed only by his compulsory conversion to Mohammedanism. Literature and science, however, still found scattered votaries, especially in northern Italy, Turkey, and Holland; and besides the great talmudists, theologians, or commentators of this period, Don I. Abarbanel, I. 'Arama, J. and L. Habib, Mizrahi, O. Bartenura, O. Sforno, I. Luria, T. Karo, the author of the talmudical abridgment or code *Shulhan arukh*, E. Ashkenazi, Alsheikh, S. Luria, M. Isserels, M. Jafeh, Sirks, S. Cohen, Lion of Prague, E. Lentshitz, J. Trani, J. Hurwitz, H. Vital, S. Edels, Y. Heller, Shabthay Cohen, A. Able, D. Oppenheimer, the collector of the best Hebrew library (now in Oxford), Tzebi Ashkenazi, H. Silva, J. Rosanis, D. Fränkel, J. Eybeschütz, J. Emden, H. Landau, Elias of Wilna, &c., we find the philosophers and men of science Bibago, S. Cohen, Amatus, Almosnino, De Castro, 'A. Zacchuto, J. del Medigo, M. Hefetz, and Nieto; and among the poets, grammarians, critics, lexicographers, and historical writers, De Balmes, Elias Levita, A. Farissol, Solomon ben Melekh, Jacob ben Hayim, Gedaliah Jahiah, A. de Rossi, De'Pomi, D. Gans, S. Arkevolte, Lonsano, Manasseh ben Israel, the defender of the Jews before Cromwell, S. Norzi, S. Luzzato, Leo de Modena, S. Mortera, J. Orobio, Shabthay ben Joseph, B. Mussaphia, De Lara, J. Cardoso, J. Abendana, S. Hanau, M. H. Luzzato, J. Heilprin, Azulia, and others. Beyond the limits of the Turkish empire there was scarcely any trace of Jewish literature in the East, though there were and are still numerous Jewish communities in Persia, northern Arabia, Independent Tartary, and Afghanistan, as well as scattered colonies, mostly of more or less mixed race and religion, in India, China, Cochin China, Yemen, Abyssinia, and other parts of Africa, partly of very ancient date, partly founded by escaped Portuguese and Spanish New Christians, some of whom also settled in parts of Brazil and Guiana during the occupation by the Dutch. In Europe the last of the three great religious struggles, against paganism, against Mohammedanism, and between the contending Christian sects, all of which were de-

structive to the Jews, was terminated by the peace of Westphalia (1648). Catholicism was triumphant in the south and in France, Protestantism in the north and north-west. The greater persecutions of the Jews now ceased. They became flourishing in the republics of Holland and Venice and their dependencies, were readmitted into England by Cromwell (having also entered Denmark and returned into France), spread with the Dutch and English to various parts of America, reentered Russia under Peter the Great (to be expelled afterward), were admitted in Sweden, and were protected and often employed in high stations by the Sultans of Turkey and Morocco. In Germany and Switzerland, where the struggle was not terminated by any decisive triumphs, the mediæval treatment of the Jews continued longest, its worst features being maintained and developed in Austria (excepting in the reign of Joseph II.), where down to the revolution of 1848 the Jews were excluded from all civil rights, numerous professions, and various provinces, districts, towns, villages, and streets, paying beside a tax for toleration in Hungary, in spite of the remonstrances of the legislatures, a tax upon their sabbath lights in Galicia, and a residence tax when visiting Vienna; while their houses in Moravia were often searched in the night of the sabbath for the purpose of surprising the returned Jewish peddlers who had been secretly married before the extinction of all older brothers, which was prohibited by a Pharaonic law. The general progress of freedom was promoted in the age of philosophy by the appearance of Spinoza and Mendelssohn (1729–'86) among this long despised people. The influence of the latter upon the Jews and Christians through his works, example, fame, and friends (the great Hebrew poet Wessely, Euchel, Löwe, Friedländer, &c., among Jews, and Lessing, Dohm, Abt, Nicolai, Engel, Ramler, &c., among Christians), was immense; and his admirers could say: 'Between Moses (the lawgiver) and Moses (Mendelssohn) there was only one Moses (Maimonides).' Progress now became general among the Jews, and the noble philosopher lived to see the first dawn of freedom in the land of Franklin and Jefferson. The great revolution in that of Voltaire and Rousseau came next, and the triumphs of republican and imperial France destroyed the mediæval institutions on



EILPRIN

ned in Poland by the Russians,
ish volunteers fell fighting to
aga (1794), was successively
ned in the United States and
were recognized in Holland,
many, Canada, and Jamaica;
y, Italy, and Hungary; and
Among the most zealous de-
were the Frenchman Grégoire,
cker, the Irishman O'Connell,
ell, the Italian D'Azeglio, and
stians; the Jews by descent
professing Jews Jacobssohn,
n, Montefiore, and Crémieux.
1848–'9 proved the immense
f public opinion since Mendels-
émieux, Goudchaux, and Fould
ong the ministers of the French
nber of the provisional govern-
nigsberg was the leader of the
ent; Riesser was vice-president
hof stood at the head of affairs
e court; Meisels, the rabbi of
strian diet by Polish patriots;
ts willingly fought under Jew-
whom the adjutant of Gen.
d became Mahmoud Pasha dur-

OLE ON HUNGARY

ite of its extreme condensation,
personages, and exhibits that
trategic movements which stood
tead, in his comments on the
ish wars. Want of space for-
ef portion of the article.

(1718), the result of Eugene's
ngdom with the Banat, the last

province of the Turks in Hungary; but after another war Belgrade was ceded to the Turks by the treaty concluded in that city in 1739. Charles's mild reign disposed the nation to defend the disputed rights of his daughter Maria Theresa (1740–'80), who appeared in person before the diet of Presburg, and was greeted with lively acclamations by the chivalric nobles. Their *Moriamur pro rege nostro Maria Theresa* was no vain promise, for Hungarian blood was shed profusely in her wars against Frederic the Great and other enemies. She rewarded the fidelity of the people by mildness, and various ameliorations of the condition of the peasantry (the *Urbarium*) are among the merits of her reign; but she too was far from strictly observing the constitution, which her son Joseph II. (1780–'90), in his immoderate zeal for reforms and centralization, was eager to destroy. To avoid binding himself by the constitutional oath, he refused to be crowned in Hungary, autocratically dictated his liberal reforms, and imposed upon the country foreign officials, a foreign language, the German, and foreign official costumes. But his violent though well meant measures were opposed everywhere, and the rising in his Belgic provinces, the unfavorable issue of his war against Turkey, and finally the threatening events in France, compelled the philanthropic despot to revoke his decrees shortly before his death. His mild and dissolute brother Leopold II. (1790–'92), afraid of the growing storm in the West, hastened to appease the Hungarian nation, which had been aroused by ignominious treatment and the spectacle of its perishing neighbor Poland to a general desire of national regeneration. The diet of 1791 again sanctioned the most essential constitutional rights of the kingdom in general, and of the Protestants in particular, and for a series of years Francis, the son and successor of Leopold (1792–1835), was satisfied during his long wars against republican and imperial France with the continual subsidies of Hungary in money and men, including the hussars, whom even Napoleon acknowledged to be the bravest in the ranks of his enemies. The rare manifestations of democratic convictions he stifled in the dungeons of his fortresses, or, as in the case of the priest Martinovics (1795), in the blood of the offenders. The magnates were flattered and remained faithful. Thus

Napoleon in vain called upon the Hungarians to rise for national independence. The last 'general rising' of the nobility was the answer (1809), but proved at the same time how incapable the old spirit was of being revived. Scarcely, however, had the dangers passed which so long threatened the crowns of Francis, when his minister Metternich made it one of his principal tasks for the restoration of the shaken and bankrupt Austrian empire to undermine the constitution of Hungary, the only check on the unlimited sway of the rulers. Every means, secret or open, was resorted to, but in vain. The progress of enlightenment, the warning example of Galicia, that withering limb of Poland torn from its body by Austria, and the spirit of nationality, rekindled by the activity of Francis Kazinczy and others, had prepared the nation for a struggle for constitutionalism and liberal reforms, which Metternich, both under Francis and his imbecile son Ferdinand V. (I. as emperor of Austria, 1835–'48), was unable effectively to resist. The Hungarian constitution had during the last few centuries undergone numerous modifications, without having at any period of its existence lost its vitality. As it was now, it was at the same time a charter of freedom, which shielded the people at large against the tyrannical sway of the princes and their ministers, against oppressive taxes and levies, and especially the Protestants and Jews against the proscriptive system which prevailed in Austria, and secured to the numerous nobility the greatest degree of personal liberty and immunity enjoyed by any class in Europe, and on the other hand an instrument of oppression in the hands of the nobility against all plebeian inhabitants of the country, especially the peasantry, which was degraded by numerous feudal burdens. The nobles were free from every tax and personal service, except in case of a hostile attack on the country itself, when they were obliged to rise in a body at their own expense; they enjoyed all the privileges of the right of *habeas corpus,* governed the countries by their regular assemblies ('congregations') and court sessions, electing the vice-counts, administrative judges, court assessors, etc., and exercised the right of legislation by their deputies to the lower house of the diet, two from each county, who in important questions were bound by the instructions of their con-

stituents. The higher nobility, or magnates, dukes, counts, and barons, together with the chief dignitaries of the crown, the Catholic and Greek bishops and some other prelates, and the county presidents or lord lieutenants, formed the upper house of the diet under the presidency of the palatine. The absent magnates were represented in the lower house by proxies, who, however, like some other minor members, had only a deliberative vote; while the deputies of all free royal towns, which had their own separate domestic administration, could cast only one decisive vote. The diet, which in the earliest times had been held at Stuhlweissenburg or on the plain of Rákos before Pesth, and during the Turkish and civil wars in various cities, was now regularly convoked by the monarch at Presburg, at intervals not exceeding three years. Its duration was unlimited. Beside general legislation, it voted the various non-domestic contributions of the country, the refusal of which was the most effective weapon against the Vienna government. The chief royal organs of general administration were the Hungarian aulic chancery at Vienna, and the royal council at Buda, whose decisions, however, very often met with opposition or delay in the county assemblies. This *vis inertiæ* of the latter was the principal check on all despotic or unconstitutional attempts of the ministers, while their publicity and jealously guarded freedom of debate were the chief elements of progress and political enlightenment. Gradually to abolish the immunities of the nobles and the feudal burdens of the peasantry, to endow the great bulk of the people with political rights, and at the same time to fortify the old bulwarks of the constitution, now became the task of the patriots; and the great movement offered the rare spectacle of an aristocracy contending for the abolition of privileges and the equality of the people. Paul Nagy and Count Stephen Széchényi were the champions of nationality at the diet of 1825, which inaugurated a long period of moderate but gradual reforms, the most important of which were carried through at the diets of 1832–'6, 1839–'40, and 1843–'4. The rights of the non-noble citizens, peasantry, and Jews, the equality of the Christian confessions, the official use of the Hungarian language, and the freedom of speech were extended, the majority of the educated lower nobility and a minority

ling against old abuses and
bureaucratic despotism and
he chief leaders of the 'lib-
nd were the members of the
yányi and Baron Eötvös; the
y of Tolna, Beöthy of Bihar,
nd Szemere of Borsod, Szent-
logh of Bars, and Kubinyi of
n agitator Baron Wesselényi,
e cabinet of Vienna chose the
ing them for treason, and im-
h for years. The old palatine
r, and the conservatives under
Emil Dessewffy, as well as of
strove to check the agitation.
when Kossuth, after a lively
ntative of Pesth to the diet of
e last rising of Poland (1846)
re of the nobles in Galicia, and
ated; the Swiss confederation
Pius IX. had given the signal
o Italy; Sardinia was arming
reparing for a new struggle.
forms, and was ardently sup-
s and the nation. A conflict
minent, when the general shock
olution of February overthrew
3, 1848). Kossuth was greeted
Vienna, and together with L.
formation of an independent
d. The people of Pesth, under
etöfi, delivered in triumph the
ancsics, proclaimed the liberty
wishes of the nation' (March
d its favorites; Batthyányi was
st of finance, Széchényi of public
f public worship and education,
al of commerce, and Mészáros
sterházy as *quasi* minister of

foreign affairs in Vienna. Having enacted the abolition of feudality, a new election law, and various other radical changes in the constitution, the last diet of Presburg dissolved, the new national assembly being appointed to meet in July at Pesth. The national government, however, whose animating spirit was Kossuth, was from the beginning surrounded by open and secret enemies, and endless difficulties and embarrassments. The cabinet of Vienna commenced its intrigues against the new order of things on the very day it sanctioned it. Jellachich and others were sent openly or secretly to organize an insurrection of the southern Slavic tribes, which had long been worked upon by a threefold national agitation, by the tools of the Austrian government against the Magyars, by popular enthusiasts in the interest of a democratic Pan-Slavic union, and by Russian emissaries in the interest of a similar union under the rule of the czar. Secret agents prepared a rising of the Wallachs in Transylvania, the diet of which proclaimed its reunion with Hungary. Dangerous tumults broke out in various German cities and among the Slovaks of the Waag. The fortresses and the foreign soldiery in the country were commanded by Austrian officers, and the Hungarian regiments were retained in Italy and Galicia. There were no national finances, no arms nor arm foundries. Every new measure met with opposition or delay through the Vienna government or its tools. Negotiations had no result. The whole south of the country was soon in a flame. The Rascians rose in the Military Frontier, in the Banat and Bács, and the Wallachs in Transylvania, the Saxons also declaring for Austria; Croatia and Slavonia proclaimed their independence of Hungary, and Ban Jellachich occupied the Littorale, and threatened to cross the Drave. Against all these contingencies the only resource of the government was its own zeal and the enthusiasm of the people. Volunteer troops (honvéds, defenders of the land) were raised in the counties, rich contributions toward a national treasury were collected, and the militia was organized. The diet assembled in July, and voted extensive levies and ample means for defence, but Ferdinand refused to sanction its resolutions. The Austrian troops which were still sent against the insurgents were led by traitors. Even Mészáros was repulsed from Szent Tamás by

w troops were slowly gathering. rave, and the Vienna govern- bardy, threw off its mask in mberg to disperse the diet by now resigned, and a committee e presidency of Kossuth. The s were transformed and blended t eloquence brought the people . Single detachments of Hun- thout their officers from abroad. ke Stephen, the new palatine, s massacred on the bridge of defeated at Pákozd near Buda nder Móga (Sept. 29) and fled volution (Oct. 6). Perczel and d at Ozora the isolated Croatian vics (Oct. 7). The fortresses, Leopoldstadt, and Munkács, the other hand, Rukavina in d hoisted that of Austria, and Rascians, who committed fright- es raged with terrible fury and was entirely lost. The pur- d with hesitation by Móga, a ntier river Leitha was crossed ed volunteers fled after a short gainst Windischgrätz and Jella- s of Vienna. Katona, sent to routed at Dées (Nov.). The cki made unsuccessful attempts ck entered Hungary from the militia on the mountain before city (Dec. 11). The Rascian honvéds to victory at Lagerndorf c. 17) on the S. E. frontier, ended the line of the Drave efend the W. frontier against Nugent, Görgey, the new com- pper Danube, retreated on the

right bank of that river, evacuating Presburg, Raab, and after the rout of the equally retreating Perczel at Moor (Dec. 29), and the engagement at Tétény (Jan. 3, 1849), the capital Buda-Pesth itself (Jan. 5). The day before, Schlick dispersed the undisciplined army of the north under Mészáros, the minister of war. Thus the government and diet, which transferred their seat to Debreczin, would have had little prospect of security if the Polish general Bem had not begun in the latter half of December a new Transylvanian campaign, which cheered the patriots with a nearly unbroken series of signal successes over the imperialists under Urban and Puchner. Görgey, too, who according to a new plan of operations returned westward on the left bank of the Danube, leaving part of his troops with Perczel on the middle Theiss, succeeded in diverting the Austrian main army under Windischgrätz from a march toward the latter river, though not in rescuing Leopoldstadt, which surrendered. Then turning northward, he skilfully fought his way through the rugged region of the ore mountains, amid continual perils, and, after a signal victory of his vanguard under Guyon, who had already proved his heroism in many a previous battle, over Schlick's corps on Mount Branyiszkó (Feb. 5), finally effected a junction with the army of the upper Theiss, which under Klapka had been successful against that Austrian general (Jan. 22, 23, and 31). Damjanics was recalled with his troops from the south, Perczel defended the middle Theiss, and Asztalos repulsed the Rascians on the Maros (Feb. 10). The activity of Kossuth and his associates in supplying all these bodies of troops with men, ammunition, money, and officers, while almost all parts of the country were alternately crossed by imperial and national armies, was admirable. The zeal of the committee of defence, however, was worthily responded to by the confidence of the people, who, even when two thirds of the country were in the hands of the enemy, almost as willingly accepted 'Kossuth's bills' as specie, and by the general bravery of the troops, old and new, hussars, honvéds, and artillerists. Order reigned in the midst of war; the prisons were empty. But new dangers arose with the invasion of the Russians from the Danubian principalities into Transylvania, where Bem, after a triumphant

checked before Hermannstadt,
by Saxons, Wallachs, and the
uld save his position at Piski
of a part of his heroic troops;
the stubborn disobedience and
dering on treason, which caused
chau, the unfavorable issue of
eb. 26, 27), the retreat of the
Theiss, the deposition of its
i, at Füred, and a considerable
loss was that of the isolated
ndered with immense stores by
ted by the dispatches of Prince
eror Francis Joseph, who had
(Dec. 2, 1848), now promul-
rch 4), which with one stroke
d national independence of Hun-
limits, a crownland of Austria.
a new series of Hungarian vic-
the night, Damjanics surprised
ns at Szolnok (March 5). Bem
mannstadt (11th), and on the
8th' (15th) drove the Russians
d Tower pass into Wallachia.
stadt (20th), all Transylvania,
nds of the Polish general, under
Poles and Viennese students
Perczel swept over the Rascian
mparts of Sz. Tamás (March,
commander of the main army,
y finally received the command,
dischgrätz was resumed. Com-
nics, Klapka, Aulich, Wysocki,
Theiss at various points, and, ad-
defeated the enemy at Hatvan
Izsaszeg (6th), and, leaving a
th to cover the main body, sud-
ook it by assault (10th), routed
(19th), rescued Comorn, which

had withstood a long siege and bombardment, and crossing the Danube, gained a victory at Acs (26th). Schlick, Windischgrätz, Jellachich, Götz, who fell at Waitzen, Wohlgemuth, and Welden were thus successively defeated in this short campaign, during which the diet at Debreczin proclaimed the independence of the country (April 14), appointing Kossuth its governor, and Aulich entered Pesth. Benyiczky and a younger brother of Görgey cleared the mountain region of the N. W. Instead, however, of continuing his victorious march to the capital of the enemy, Görgey returned with the bulk of his army to the siege of Buda, which had been strongly fortified and was strenuously defended under Henzi, while a new and extensive Russian invasion was approaching. Buda was finally stormed (May 21), Henzi being mortally wounded, the government and the diet returned to the capital, and Görgey again took the field; but, bent on intrigues against Kossuth, the new presiding minister Szemere, Dembinski, who commanded in the north, and his own generals, he chose the N. bank of the Danube for his new campaign, which suited his political schemes, and, without profiting by Kmetty's victory at Csorna, S. of that river (June 13), wasted the blood of his army on the Waag. The Russian armies and fresh Austrian troops under Haynau were in the meanwhile pouring into the country from various quarters. Wysocki, the successor of Dembinski in command, retreated before Paskevitch; Temesvár was unsuccessfully besieged by Vécsey; Bem was paralyzed by a new and more terrible rising of the Wallachs, while his province, too, was invaded by the Russians. After various unsuccessful struggles on the line of the Waag (June 16, 17, 20, 21), the loss of Raab (28th), and the great battle of Szöny (July 2), Görgey, leaving Klapka in Comorn, finally retreated toward the middle Theiss; but after a bloody fight against Paskevitch at Waitzen (15th), he turned northward, again and again repulsing the Russians, and crossed the Theiss at Tokaj. The Russians crossed it at Füred, while the central Hungarian forces under the chief command of Dembinski retreated toward Szegedin, where they were joined by Guyon, who had routed Jellachich at Kis Hegyes (14th). The government leaving the former place, where the last session of the diet had been held,

retired to Arad, which, having recently surrendered, was made the last point of general concentration, after the rout of Bem at Schässburg by the Russians under Lüders (29th), of one of Görgey's divisions under Nagy-Sándor before Debreczin by the army of Paskevitch (Aug. 2), and of Dembinski at Szöreg by Haynau (5th). Dembinski, however, retreated toward Temesvár, where his army suffered a terrible defeat (9th). Görgey, who now arrived at Arad, summoned Kossuth to resign, and received from him the supreme civil and military command (11th), Klapka's sally from Comorn and signal victory over the besieging Austrian army (3d) being unknown at Arad. Two days later Görgey surrendered his army at discretion to the generals of the czar at Világos (13th). Damjanics followed his example, and surrendered Arad (17th). Kossuth, the late ministers Szemere and Casimir Batthyányi, the generals Bem, Dembinski, Mészáros, Vetter, Perczel, Guyon, Kmetty, Wysocki, and others, fled into Turkey. Munkács, Peterwardein, and Comorn capitulated. But scarcely had the tricolor disappeared from the ramparts of the last named fortress (Oct. 4), when the work of revenge commenced on the side of the victors. Count Louis Batthyányi, who had been made captive on a mission of peaceful mediation, was executed at Pesth (6th), and the generals Kis, Aulich, Damjanics, Nagy-Sándor, Török, Lahner, Vécsey, Knézich, Pöltenberg, Leiningen, Schweidel, Dessewffy, and Lázár, all of whom had surrendered at discretion, were executed on the same day at Arad. The old president of the upper house at Debreczin, Baron Perényi, Szacsvay, Csernyus, Giron, Abancourt, the young Polish prince Woroniecki, the revolutionary minister Csányi, and Baron Jessenák were executed at Pesth a few days later, like most of the preceding, on the gallows. Col. Kazinczy was shot at Arad. Other executions followed. The dungeons of the empire were filled with prisoners for life or a long term of years, including priests, officers, and government officials of every confession, rank, and age. Görgey was confined at Klagenfurth. The remnants of the Hungarian troops were impressed into the Austrian army, and the estates of the rich patriots confiscated. The country remained under martial law, receiving new divisions, authorities, and tax regulations, and

foreign officials. The German was made the language of the recognized higher courts, offices, and schools. New contributions, military levies, and so called voluntary loans, followed each other. A conspiracy and an attempt on the emperor's life led to the resumption of wholesale executions in 1853. The Protestants and Jews were subjected to particular restrictions. Thus in spite of various scanty amnesties, and two journeys of the emperor through the country, the feelings of the nation remained hostile to Austria, and the attack on the latter by France and Sardinia in the spring of 1859 became the signal for national agitations abroad (under Kossuth, Count Ladislas Teleky, Klapka, and others) as well as at home, which, after the sudden discomfiture of all sanguine hopes by the agreement of Villafranca, concentrated themselves in a moderate but steady opposition to the new religious, financial, and municipal measures of the Vienna ministry, chiefly under the lead of the 'old conservatives,' and in peaceful but general demonstrations of the people. Of the latter the centennial celebration of the birthday of Francis Kazinczy (Oct. 27, 1859), in commemoration of his literary activity, his martyrdom for freedom being understood, was the most significant. Soon after numerous arrests took place throughout the country, and the 5th Austrian army corps was recalled from Italy to be placed at the disposal of the governor, Archduke Albert (Dec. 1859)."

To those familiar with encyclopædic requirements and standards, it is scarcely necessary to point out the extraordinary comprehensiveness and lucidity, the unerring scholarship and closely-knit texture of these historical essays.

XI

LIFE IN WASHINGTON

The completion of the Cyclopædia left Mr. Heilprin once more without adequate means of subsistence, and he resolved to return to an experiment which had proved fairly successful in Hungary, but which is generally attended with far greater difficulties in this country — that of establishing a bookstore. He chose Washington as the most suitable place for such a purpose, and from 1863 to 1865 the family resided there. If the experiment proved financially disappointing, it at least brought Mr. Heilprin into contact with congenial spirits, such as Mr. Spofford, the Librarian of Congress, and it was not long before men prominent in the political world of the Capital sought and enjoyed the company of the learned bookseller. Mr. Heilprin had interesting conversations with Secretary Seward and Senator Sumner, and became particularly well acquainted with Charles A. Dana, then Assistant Secretary of War, and Count Gurowski, a former Polish revolutionist and voluminous author in several languages, whose eccentricities of temper alienated from him not a few friends who had learned to value his solid endowments. Mr. Heilprin enjoyed also his contact with the physicist, Professor Joseph Henry, whom he often visited at the Smithsonian Institution and at his house.

Even while engaged in the book business, Mr. Heilprin continued his journalistic labors. In 1864 he contributed a paper entitled "Nos Amis les Cosaques" to the Boston *Continental Monthly,* a periodical founded by the poet Charles G. Leland, whose acquaintance he had made in Philadelphia. In July of that year he became an editorial contributor to Col. Forney's Washington *Chronicle,* which was considered during the War the inspired organ of Lincoln's administration. Mr. Heilprin's articles in the *Chronicle* showed his usual wide range of subjects. He wrote on "Transatlantic Affairs," "Moldo-Wallachia," "Eastern Europe," "The Dano-German War," "The

Slavic World," "The Trial of the Thirteen in France," "Mexico," "The Belgian Elections," "The Disturbances in Geneva," "South-American Affairs," "The Polish Emigration," "Italy," "Austria," etc.

After he was compelled to close the doors of his bookshop, Mr. Heilprin ventured upon an even more hazardous experiment. He started a political weekly, *The Balance,* becoming his own editor and publisher. Not a single copy of the journal has remained in the possession of the family, but, judging from the character of the editorials saved in Mr. Heilprin's scrapbook, the enterprise deserved a longer career than was vouchsafed to it. The clippings cover only the two months — May and June, 1865 — which comprised the life of the magazine. The articles concerning domestic subjects are mainly in the nature of solemn warnings to the American people to be just and moderate in their dealings with the South. Particularly impressive are "The Clamor for Blood" and "A Voice from the Springfield Tomb." In the latter article Lincoln is represented as saying:

"Already I feel the earth teeming with fresh vigor, inspired by reviving labor. And the sword is to be forged into a plowshare, and the bayonet into a pruning hook; and the metal of the cannon will, from peaceful steeples, call the people to labor or prayer, and no more thunder desolation over blood-deluged lands. Already I hear the tramp of returning armies; the men of the North going north, and the men of the South going south, all towards their homes, no more against foes; to resume the work of production, after years of devastation.

Yes, I hear them coming north, my brave boys, returning as veterans and citizens! Oh! that I cannot see them returning, and press their victorious hands, as I pressed them on the gloomy days when they started to brave a thousand perils and to fight a thousand battles; the hand of each, from that modest man who led them all to victory, and is the chief of all; from him who on the fields of Pennsylvania saved my capital and the North; from him who near the banks of the Chickamauga, when heroes fled, stood like a rock, and stemmed the tide of disaster; from him, who, marching and remarching over vast extents, made war history almost read like a tale; and from

army himself, and down South
hese down to the humblest of my

are approaching. March on,
ards lasting peace, among our-
ith others. May the canker of
on your hearts; may it never

, and the voice of the people's
ll our fathers built and we de-
long victorious in the cause of
for conquest and plunder, de-
e name of their country's great-

idolatrous venom! Was Rome
ns and burned Jerusalem? It
ft the plow to save it, and then
abylon great? or is Switzerland
ls, my people, beware of that
of glory!"

XII

IS CHILDREN AND HIS ›THER-IN-LAW

›ed an unprofitable field in other ways, ıons as the centre of political interests. the entire family followed the march of .eenest anxiety, and this interest was not · family, in the spring of 1866, had removed Y. It was his habit to comment, with ani- an informing way, upon public affairs, but in his children he rarely touched upon events of ıe necessity of sparing his eyes imposed brevity. however, been preserved a letter by him written in ıis two youngest daughters, Susan and Celia, — then ›it in Washington, — commenting at length upon a ›f President Johnson's which had aroused extraordinary ›t. The first annual message referred to was at that time ›ed to have been written by Secretary Seward. It has ›: been ascribed to Bancroft. The letter is undated.

"As to your perplexity concerning President Johnson's ·eech and policy, I am not able fully to satisfy your desire ›r enlightenment, remote as I am from the seats of the develop- ›nent which must determine political action, as well as from the circles in which our rulers deliberate. But I think that I can, without bias or haste in judgment, condemn, on the one side the speech — its *tone,* in general and particularly some of its phrases — without, however, finding it half as atrocious or abominable as many declare it to be, and, on the other, assert his policy, as expounded in the annual message, in the veto message, and in Gov. Cox's letter (in to-day's papers) to be the genuine Seward-Lincolnian, thoroughly consistent in itself, as loyal — if not as philanthropic — as any, not at all deserv-

ing of objurgations, and as much entitled to *a careful examination and friendly consideration* as any other scheme of reconstruction or regeneration. *Whether it be the right way to choose is a different question.* I believe the President was too harsh on Sumner, less so on Phillips, who declared him a traitor first, with plenty of other epithets, and perfectly correct in reference to Forney. Stevens he was certainly wrong in classifying with Sumner; neither is the name 'traitor' applicable to him, who is only unscrupulous and foolish as a legislator. The great misfortunte of the President, or rather Mr. Seward, who is the *documentary* president, is that their policy is supported by the vilest of demagogues and the lowest political rabble the world ever produced. But to make inferences from the applauders on the public speaker or actor is a dangerous thing, especially in times when party spirit runs so high that moderate men will not dare to form a centre, and extremes rule the hour. But to call Johnson or Seward a Copperhead is just what Ujházy lately did in regard to Deák and the Hungarian diet. Ten years ago U. would have been generally applauded. Years hence, such a way of talking of J. and S., as is now followed by the Tribune, f. i., will be treated with as much scorn as U.'s letter was. In times of wild agitation either Louis XVI. or Lafayette, Czartoryski or Lelewel, etc. etc. must appear as monsters to the bewildered spectators. Thus now nobody takes into consideration that Johnson, the proud Anglo-Saxon Southerner, never thought of fighting the South and risking his all in order to see his state disfranchised after victory, himself and his fellow-citizens ruled by military intervention from abroad, and his section of the country threatened with Africanization; and everybody hastens to forget that Seward has barely escaped death at the hands of those of whom he is represented as so very fond.

All this, dear children, I wrote only for yourselves, to continue, in part, the hints I used to give you, in regard to the manner I approve of of judging public men. *Policies* I hardly venture to judge myself, whenever the question is vast and complicated. In *this* case I believe a *great part* of what is said by the better men of *either party*, and that whichever policy will prevail is doomed to be, in future, almost generally condemned,

the evil being so extraordinary that no such transient and limited rulers or statesmen as ours can even as much as hope to succeed. Events will march, and the laws of nature will decide, but not the wisdom of politicians. The settlement of the great question of races on the continent, begun by the sword, will not be carried through, I believe, by platforms, speeches, and editorials. The 'wrath of man' must be changed, or the 'wrath of man' will finish the work. Let us, however, hope for the best. And when not much good can immediately be expected, let us amuse ourselves, and enlarge our views, by the spectacle of warring factions, contending opinions, and more or less useful or brilliant exertions of the mind. This spectacle, dear children, I wish you to enjoy as much as circumstances allow, calmly, with 'charity for all, malice towards none.'"

While still in Washington, and shortly after his connection with the *Nation* had begun, Mr. Heilprin wrote one or two articles for the short-lived *Round Table*. The editorial on "Otto von Bismarck" bears the general characteristics of his contributions to the *Nation*.

The poet in Mr. Heilprin's nature, who had so sympathetically hailed Garibaldi's rising of 1860, was contradicted by the statesman and historian, who, six years later, about two months after the battle of Sadowa, discountenanced the idea, then broached by some Hungarians in this country, of instigating an anti-Austrian rising in Hungary. He expressed himself as follows in a letter to his brother-in-law, M. J. Franklin (the first page of the closely-written letter is in Hungarian; what is quoted is the English continuation):

"As regards our dear Hungary, I am sorry to find so great a difference of opinion between W. [Washington] and N. Y. circles. However, in matters of expediency, to which the timeliness of an insurrection undoubtedly belongs, people will always differ, according to the degrees of their experience, caution, boldness, determination, or rashness, which must necessarily vary. On my part, I must confess, dear Franklin, that my own experience, historical studies, and individual temper have led me to the following conclusions.

1. Out of twenty risings, for independence or republican

freedom, but unaided or unprepared, one succeeds, witness Poland under Kosciuszko, Chlopicki, etc., Microslawski (1846 and 1848), or Langiewicz; Italy in 1820, 1821, 1847 (Sicily), 1848 and 1849 (under most auspicious circumstances); Spain from 1820 to 1865; Ireland in 1798 and 1848; Schleswig-Holstein; the Sonderbund; Bohemia, Vienna, Saxony, Baden, etc., in 1848–9; the Secession rebellion (and what a rebellion!), and numberless other outbreaks from the Volga to the Tagus.

2. Hungary, since the princes of Transylvania have succumbed, has failed in every insurrection from Tökölyi and Rákóczy down to Kossuth, and has had only 'bloodless victories,' as in 1790 and 1823; threatened as she is by hostile Croats, Rascians, Serbs, Wallachs, Saxons, etc., within, and by Russia without, she cannot afford to risk experiments, which might not only lead to defeats and sufferings, as in Italy or Spain, but to the swamping of her whole nationality, as in Poland. Bismarck, Victor Emanuel, and Napoleon can no more be trusted than perfidious Hapsburg, who would undoubtedly have yielded to any terms in order to suppress a revolution (a revolution without a fortress, without arms, without a legal head). . . .

3. Neither Prussia (as yet) nor Italy desires the final destruction of Austria, the former dreading a revolutionary Hungary and Galicia, the latter an all-powerful Germany, while Russia and France dislike the one as well as the other.

4. Successful insurrections are mainly the sudden outbursts of the people in the capitals of consolidated states, where a few determined squads or even individuals can change, in a day, a dynasty or form of government, as in Rome, Constantinople, or Paris, or they owe their consummation to foreign intervention, as in Greece or Belgium.

5. A so-called revolutionary doctrine or systematic revolutionism is justifiable only when universal, as in 1848; in other times it is no more than fanatical madness or recklessness, the offspring of despair, historical ignorance, or selfish, designing demagogism.

6. Hungary owes her national existence and long periods of constitutional freedom to her avoiding the perils into which

Poland, for instance, so often plunges herself from ungovernable despair, and to the wonderful spirit of unity which makes her rise like one man, and, if necessary, bide her time with the same unanimity; hence her great leaders, made great by a disciplined nation, *each in his time*, Rákóczy, Széchényi, Kossuth, or Deák.

7. Revolutions cannot be improvised by proclamations from abroad, and must have a base of operations within, or be carried in by invading armies.

8. Italy owes her deliverance both to that internal base, Piedmont, and the armies of France (in 1859) and Prussia (in 1866); with 400,000 men, a navy, and 25 millions of people she proved unable to wrest Venetia from Austria, whose main armies were far away in the north.

9. Kossuth was driven to his last failure by his situation in Italy and connections with her statesmen; the result shows how terribly he miscalculated the position."

XIII

A LETTER FROM CHARLES ELIOT NORTON — MR. HEILPRIN'S ASSOCIATES OF THE AMERICAN CYCLOPÆDIA — RELATIONS WITH W. P. GARRISON AND E. L. GODKIN

From the first, Mr. Heilprin's contributions to the *Nation* and his personality greatly impressed the editors. In August, 1866, Mr. Garrison wrote to Mr. Charles Eliot Norton, suggesting that Mr. Heilprin be invited to deliver a course of lectures at the Lowell Institute. To this Mr. Norton replied in a letter, dated Ashfield, August 19, 1866, which Mr. Garrison sent to Mr. Heilprin, and which is among those preserved by him:

"I am much interested by what you write me of Mr. Heilprin. His articles in the *Nation* have given evidence of varied and uncommon learning.

He is just the man to be invited to lecture at the Lowell Institute, if his abilities fit him for the lecturer's desk. It is difficult, however, always to get the right appointments made. . . . I will see that Mr. Heilprin's name and qualifications are brought to his (Mr. John A. Lowell's, then sole Trustee of the Institute) knowledge, and that such influence as may be used in Mr. Heilprin's favor is exerted.

But, I am quite confident that there is no chance for obtaining an invitation for Mr. Heilprin for the next winter. The courses were long ago arranged for, as I happen to know, having been interested early last spring in securing a course for Mr. Squier. At that time I saw Mr. Lowell, and understood from him that Mr. Squier's name filled his list for 1867. Suppose as a preparatory step Mr. Heilprin were to write for the *North American* a paper on the Hebrew Literature of the present century, or on some other literary subject with which he feels himself familiar. I would gladly publish it, were it as

well done as I have little doubt it would be, and it might be an effective instrument in obtaining for Mr. Heilprin a course of lectures in the winter of 1867–8."

Mr. Heilprin did not act upon Mr. Norton's suggestion. Among the reasons which prevented his doing so was doubtless a certain abiding disinclination to undertake anything, however innocent and proper in itself, which might seem like a design or merely a means to an end. He would, of course, have been glad to write for the *North American Review* had a suitable subject then naturally suggested itself to him. As a matter of fact, he wrote many years afterwards — I think in the eighties — a review of some book or books on Oriental subjects.

The course of time modified Mr. Heilprin's views concerning the relations between Austria and Hungary. He welcomed most cordially the Compromise of 1867 — the work of Francis Deák, whom he revered as he did no other statesman of modern times. With what enthusiasm he spoke of the new Hungary and its future! There was, on such occasions, in his speech perhaps a shade of longing to take a part in the reorganization of the country whose fortunes he had shared and followed so affectionately, but his affection for the country in which he and his children had taken such firm root was still greater, and he never seriously discussed the idea of returning to Hungary. Had he gone back, there can be no doubt that he would have made for himself a place in the Hungarian Parliament for which his wonderful rhetorical abilities and his statesman-like grasp of historical questions so preëminently fitted him.

It has been seen, from the tenor of Mr. Heilprin's editorial articles on the war of 1870–1, how fully he espoused the cause of Germany, but this feeling did not proceed from lack of sympathy with France herself, for whose misfortunes he held the government of Napoleon III. mainly responsible. Mr. Heilprin had an intellectual kinship with German scholarliness and solidity, but he appreciated none the less the world's debt to French liberalism and French literature. Like many enlightened minds, who in the revolutionary spirit of 1848 saw but the triumph of the ideas of 1789, Mr. Heilprin always acknowledged how deep and permanent had been the impress on him

of the French writers who glorified the heroes of the Revolution. I remember hearing Mrs. Heilprin relate that, on the appearance of Lamartine's *Histoire des Girondins,* in 1847, her husband, in the company of some equally enthusiastic Hungarian friends, sat up all night reading and discussing its eloquent pages. But he was too sound a historical scholar to surrender himself to mere charm of style, and his reading was always marked by great catholicity of taste. The sober narrative of Guizot interested him as much as the picturesque, if one-sided, presentment of Thiers or the fervid rhetoric of Louis Blanc's *Histoire de Dix Ans;* Macaulay he enjoyed as much as Grote or Michelet. He had a particular liking for Gervinus, as he had for Ranke and for Gibbon. Among American historians he ranked Prescott as by far the greatest. Of the ancients, he admired Thucydides equally with Tacitus.

When, in 1872, the revision of Appleton's Cyclopædia, under the title of "The American Cyclopædia," was projected, the editors-in-chief, George Ripley and Charles A. Dana, once more sought the services of Mr. Heilprin. Their estimate of him may be gathered from the characterization of Mr. Heilprin, in O. B. Frothingham's *Life of George Ripley,* as "the omniscient, a man of boundless erudition, master of all languages, Eastern and Western." Mr. Heilprin was, as one of the four associate editors originally selected, entrusted with the final revision of the work, after the proof-sheets had passed the scrutiny of everyone else. He was privileged to make any corrections he saw fit and to reject, or to rewrite, parts of any article or even an entire article, and make direct suggestions to the writers of such articles. On not a few occasions some of the prominent contributors sought the benefit of Mr. Heilprin's suggestions or criticism at his own house, for as a special concession to him, and in view of the fact that he was there within reach of his own ample library, he carried on his work at home. Throughout the years of revision, he was in his working room surrounded by his children, both daughters and sons, his faithful and efficient assistants, who had become familiar at an early age with various languages and the details of editorial revision. Numerous indeed were the occasions when both publishers and editors-in-chief expressed their high

appreciation of the value of Mr. Heilprin's services. Although usually such direct communications as he had to make to Messrs. Ripley and Dana were by letter, he was in frequent personal contact with them. His relations with them were at all times most cordial. He was particularly intimate with Mr. Dana, who generally preferred to converse with him in German. Of the Associate Editors he was closest to the genial Robert Carter, a man of varied attainments and the early and intimate friend of James Russell Lowell, and to Francis E. Teall, whose extraordinary accuracy and thoroughness in critical proof-reading, which went far beyond the ordinary requirements, Mr. Heilprin had learned to admire in his first connection with the Cyclopædia.

He gave the same careful revision to the Condensed Cyclopædia, in four volumes, begun after the completion of the larger work and finished in September, 1877. A new edition of the entire Cyclopædia was planned in 1880, but after some preliminary work, in which Mr. Heilprin shared, the idea was abandoned.

The *Nation,* during all the years when Mr. Heilprin was kept by his encyclopædic toil from sending more than an occasional contribution to its columns, was eager for the resumption of his connection with it. More than once Mr. Garrison wrote or spoke to him, good-humoredly expressing his impatience for articles from his pen, as he did in the following letter:

New York, January 11th, 1875.

DEAR MR. HEILPRIN:

I have just received your son's [Angelo's] notice of the "Encyclopædia Britannica," and shall be glad to use it next week. Let me also improve this opportunity to say that his notice of Huxley, somewhat abbreviated, will be inserted as soon as I can make a place for it. We were never in such distress for room; and yet I am looking forward to the time of your "emancipation" and the beginning of your Cyclopædia series.

With heartiest wishes for the New Year,

Sincerely yours,

W. P. GARRISON.

Both Mr. Godkin and Mr. Garrison were, however, too sincere admirers of their valued contributor not to wish for him, after his connection with the Cyclopædia had ceased, a sphere wider and more remunerative than that which they could offer him. He had, as he could not but know himself, unusual qualifications for a professor's chair — although he felt that the want of a college degree might stand in his way — and at one time it seemed as though that of biblical literature at Harvard were within his reach. Mr. Godkin had suggested to President Eliot Mr. Heilprin's name when, in 1879, that chair became vacant, and upon Mr. Eliot's invitation, Mr. Heilprin met him and Dr. H. W. Bellows one evening at the latter's house, in New York, where a tentative discussion of matters bearing on the purpose of the interview took place. For reasons unknown to me the appointment was not made, but I may say that Mr. Heilprin considered President Eliot's final choice, that of Professor C. H. Toy, a very excellent one. In one way or another, Mr. Heilprin's name was more than once on the lips of men in want of just such co-operation or advice as he, perhaps better than anyone else, was able to give. Under date of May 26, 1881, Mr. George Bancroft wrote to him from Washington:

My dear Sir:

Two years ago our friend, Mr. Ripley, wrote me a note inclosing a note which you addressed him. I hope in the course of this season to go upon a final revision of my history, which I wish to purge as far as possible of error. Is your time now so at your own disposal that you could give me your aid as suggested in your letter to Mr. Ripley of March 24th, 1879? I shall remain at Washington until the first day of June. After that time my address will be at Newport, R. I.

Yours very respectfully and truly,

Geo. Bancroft.

It is my impression that some further correspondence took place between Mr. Bancroft and Mr. Heilprin, in the course of which Mr. Heilprin's son, Louis, was mentioned for the work Mr. Bancroft had in view. In any case nothing came of the matter.

XIV

MR. HEILPRIN'S WORK FOR THE RUSSIAN REFUGEES

The year 1881 marked an important change in Mr. Heilprin's hitherto peaceful life. In that year the fury of barbarous atrocities drove the first Jewish refugees from Russia to these shores. Mr. Heilprin's soul was stirred to its depths. No one foresaw more clearly than he the probable extent of the persecution then begun and the need of wise measures for the relief of its victims. There was here much sympathetic talk on the part of Jews and Christians, some willingness to assist the newcomers, but there was also a vague dread of an overwhelming influx of foreign hordes ill-fitted for American conditions. The task before the Jewish community of New York was indeed one to call for the wisest philanthropy and for patriotic and practical measures. Mr. Heilprin had for many years had little in common with purely Jewish affairs. He was not a professing Jew in the strict sense of the word. He was not a member of any synagogue, and he had for many years conformed in his home life to none of the ceremonies prescribed by the Jewish faith. But he had retained all his old-time interest in the race, gloried in its achievements, and deeply felt any wrong and humiliation which Jews anywhere suffered for their faith or race.

Among the early refugees, many of whom sought his house, there were young men full of an enthusiastic determination to show to the world that the persecuted Jews of Russia needed but the air of a free country to become successful tillers of the soil. Mr. Heilprin shared this belief and, fully realizing what such a step meant to him, he resolved to throw himself, heart and soul, into the cause of Jewish agricultural colonization. He found a few kindred spirits who shared his enthusi-

asm and readiness for self-sacrifice, foremost among whom was Dr. Julius Goldman, a young lawyer, who throughout the anxious years in store for Mr. Heilprin was his devoted and efficient colaborer.

In March, 1882, after much arduous preliminary work, the Montefiore Agricultural Aid Society began its operation. Michael Heilprin was its secretary, ex-Judge M. S. Isaacs the treasurer, Julius Goldman the controller. Mr. Heilprin devoted all his time to the cause of the refugees. The collecting of funds, most of which came as the result of Mr. Heilprin's personal solicitation, formed but a small part of his efforts. In addition to planning and caring for the colonists, Mr. Heilprin was the leading spirit in the organization which was hurriedly created to take charge of the incoming flood of Jewish immigrants of whatever kind. For months he spent many hours of the day in the dingy basement office in State Street which served as the headquarters of the Aid Society, devising measures for the housing of the rapidly increasing number of arrivals, for the immediate relief of the needy, and for the transportation to other places of those willing and able to leave the city. Nor was this all. The situation had to be explained, in their own language and dialect, to the bewildered immigrants. More than once, during the hot days of the summer of 1882, and in the stifling atmosphere of the State Street office, Mr. Heilprin had to point out to the hapless mothers of young children the need of the most elementary sanitary rules; not infrequently he was compelled to argue earnestly with the more impatient and obstreperous of the immigrants, who could not or would not always understand that the land of liberty was, like the countries of the old world, subject to laws and restrictions which must be obeyed. Perhaps more trying than all, he had to overcome, as far as lay in his power, the prejudice of those of his race who could see only the uncouth aspects of the refugees and failed to recognize the idealism, the intellectual alertness, and the various latent abilities which have since, in so many cases, asserted themselves among them and their descendants. I recall an instance when, at a meeting of prominent Hebrews, after some inconsiderate talk about Polish and Russian Jews, Mr. Heilprin arose and quietly said: "I am a

Polish Jew, I belong to that despised race." An impassioned appeal to the better feelings of the audience followed, and the effect was extraordinary.

I have before me, as I write, the memorandum book which bears, in Mr. Heilprin's beautiful handwriting, the names of all the colonies, "founded or aided by the Montefiore Agricultural Aid Society (formerly New-Odessa Fund)." They were as follows:

New Odessa, in Douglas Co., Oregon.
Crémieux, in Aurora Co., Dakota.
Bethlehem-Judah, in Davison Co., Dakota.
Carmel, in Cumberland Co., New Jersey.
Montefiore, in Pratt Co., Kansas.
Lasker, in Ford Co., Kansas.
Hebron, in Barber Co., Kansas.
Gilead, in Comanche Co., Kansas.
Touro, in Finney Co., Kansas.
Leeser, in Finney Co., Kansas.

An Appeal to the Jews

Many were the disappointments that awaited these colonists, but Mr. Heilprin and his associates kept up a stout heart. In November, 1883, they issued a stirring appeal, from Mr. Heilprin's pen, to the Jews of the United States, in which they set forth the rise, scope, and aims of the Montefiore Agricultural Aid Society and thus described the conditions of the colonies established:

"Very shortly after the arrival of a large number of Russian refugees in this country, some twenty months ago, we became cognizant of the fact, that, among the many whose misfortune and misery appealed to the benevolence of their more fortunate brethren, there were not a few whose firm determination or ardent desire to devote themselves to agricultural pursuits, in the land which was to become their new home, deserved special attention. There were elderly men who had tasted all the wretchedness, and had felt the shame, of Jewish trading life in Russia; but side by side with them, strenuous youths whom a suddenly awakened Jewish enthusiasm had led to the fixed

purpose of becoming the pioneers of their down-trodden and decried people in a field of natural, useful, and redeeming activity. Some of these men were enthusiastic dreamers, others were equally clear-sighted and resolute; some had nothing to lose, others were ready to sacrifice to their ideal alluring personal chances and lucrative careers formerly entered upon. Their determination, the end in view, appealed to our sympathy, and we did not refuse our help.

We devoted our first attention to an organized association of capable and well educated young men from South Russia, chiefly from Odessa and its environs. We formed a small Committee for the foundation of a colony to be called New Odessa. It was no light task to collect means for this object, at a time when every day brought into our port vessels thronged with refugees, whose hunger and want of shelter pressed every other claim upon public charity into the background. We had also to contend with an anti-Russian prejudice, an outgrowth of ignorance and self-over-estimation kindred to anti-Semitism. But few understood the language, the sentiments, the aims and inclinations of the strangers. But few would believe that among the wrecks of distant communities which a storm of persecution had driven to our shores, there was material for construction which might become an honor to this country, and to all Israel. The misery which made its appearance in our thoroughfares offered an aspect far from attractive. Its cries of impatience were disturbing sounds. The resignation and self-helping efforts of the most modest and patient sufferers escaped attention. The offences of the few were charged upon the multitude. Prejudice bred prejudice; an unbrotherly treatment produced rancor and spite, together with despondency. Many a small gift was offered with rudeness, some generous help was requited with ingratitude. The first attempts to found an agricultural colony (in Louisiana) failed in consequence of hasty action and an improper choice of the locality. Public benevolence limited itself to offering sustenance and occasional aid, which required immense sums. Only when dire necessity demanded the removal of many of the unfortunates from the overcrowded city districts, were colonizing attempts on a larger scale made by the Hebrew Emigrant Aid Society — in the

States of New Jersey and Colorado — partly with means obtained from Europe. A great deal was sacrificed, with little faith.

Notwithstanding these difficulties we succeeded — thanks to the enlightened generosity of single sympathizers — in carrying out the colonization of the Society to whom we had offered our aid. Travels of exploration and various other efforts were required, but the strenuous perseverance of our protégés lightened the execution, and a year had hardly elapsed since the beginning of the undertaking when a goodly number of Russian-Jewish youths completed the foundation of New Odessa Colony in the State of Oregon, near its southern border and the Pacific Ocean. The money which we collected for the purpose we used for transportation and the purchase of a farm of seven hundred and sixty acres, of horses, implements, etc., but the maintenance of the Association has to this day entailed upon us no expense whatever. The young men have done a great deal of hard work, their zeal has not abated, and the future of the colony is promising. It is able to maintain itself in spite of trying privation and scantiness of means — even if no further aid whatever is afforded it; generous assistance could rapidly make it flourishing, and promote its expansion. It now furnishes the Oregon and California Railroad — which traverses it — with wood for fuel from its woodlands, and, if possessed of the necessary steam-saw machinery, could also supply that railroad with the sleepers required for its extension.

Even before this colony was called into life in the remotest Northwest of the Union, we succeeded in establishing a few other refugees in the wonderfully prosperous northern Territory of Dakota. Here, in the neighborhood of Mitchell and Mount Vernon — in the southeast of the Territory — two families returned from the wrecked Louisiana Colony, with some friends who followed them from Russia, had settled, unaided, on 'homestead' lands. These men, who devoted to their work an indomitable energy and the remnant of their fortune, were joined by a number of others, and soon two colonies arose near each other; Crémieux and Bethlehem-Judah. Some aid was obtained from the Hebrew Emigrant Aid Society, as well as from European Associations. Further to the northwest, a col-

ony was founded in the same Territory, near Bismarck, by Jewish sympathizers in the City of St. Paul; another was founded in the State of Kansas, by Cincinnatians; another, by Baltimoreans, on the Rappahannock, in Virginia. Hard was the beginning everywhere, as was the winter in which the settlers, poorly clad and poorly housed as they were, spent the first months of their farming life on uncultivated soil. Worse still was the situation of such scattered agriculturalists as had gone to remote parts without a plan and without aid. When the Hebrew Emigrant Aid Society dissolved, in the spring of this year, the Louisiana Colony had long disappeared; that of Cotopaxi, in Colorado, was breaking up; and Alliance (near Vineland) and Estelleville, in New Jersey, were in a chaotic condition.

The situation, in general, was then a greatly disheartening one. Only from Oregon and Dakota came some rays of hope. But we had had too many occasions to admire the firmness and enthusiasm of many of the refugees who devoted themselves to agriculture, now to give up all hope of a turn for the better and abandon our efforts. We, therefore, resolved to keep up our little organization, and, having accomplished our task in Oregon, to bestow the little help we could afford on particularly hard struggling settlers in southeastern Dakota and New Jersey. The ex-President of the Hebrew Emigrant Aid Society and some of his former associates continued to be active for the benefit of Alliance (the 'Vineland colony') and Estelleville; the colonies in northern Dakota, in Kansas, and Virginia were maintained by their respective founders and protectors. The colony in Cotopaxi, however, broke up entirely. Nor could that of Estelleville be saved. But a smaller settlement in the same region, at Beaver Dam in southern New Jersey, was preserved by our efforts, and we also found means of providing for some young men who were anxious to share the agricultural toils of the colonists in southeastern Dakota. Others flocked thither without any assistance. The most munificent protector of the refugees in this city planted a large family on the same soil. The late spring was succeeded by a delightful, bounteous summer. Hope revived, and with it came fresh energy. The value of the homesteads obtained from the

American Government for a nominal price rose beyond all expectation. The willingness and capacity for labor of the Russian colonists met with general acknowledgment; the misery of their brethren in the cities had been diminished or partly vanished out of sight; ability and steadiness had found their reward; a better sentiment began to prevail everywhere, the helpers felt happier, the helped became more grateful. New collections for Alliance, with the object of propagating manufacturing industry there, proved an increased readiness to assist the toilers. A decidedly friendly and humane disposition was everywhere evinced by the non-Jewish neighbors of these victims of persecution. The hardships of their present have not ceased to be severe, but the future has ceased to appear hopeless and dark.

The general situation of the Russian colonies has, indeed, improved beyond all our expectations within the last few months. The thought is highly gratifying that Jewish agricultural colonies have taken root in the most diverse parts of this vast country; that the settlers of New Odessa, in Oregon, have maintained themselves by their own labor alone for more than a year; that several Slavic Russians, prompted by an enlightened feeling of patriotic sympathy, have followed them from the Atlantic shore to their distant Pacific home — an incident which forms one of the brightest pages in the annals of the Jewish exodus from Russia; that the Alliance (or Vineland) colony already embraces seventy families; that in the southeastern district of Dakota which includes Crémieux and Bethlehem-Judah the Russian-Jewish settlers are in possession of more than nine thousand acres of excellent farming land; and that hundreds of other refugees are anxiously looking forward to the moment when they might be able to join their friends on the farms, among them men reared in easy circumstances and now pursuing remunerative occupations in cities. Should the colonies continue to advance on the road to prosperity, thousands of others would be induced to strive for the same object. We have enabled many a struggling refugee to attain this ardently desided end, and we are still ready to devote a portion of our limited time and strength to this cause, which is so dear to the hearts of the best of the Jewish immigrants; but the means

which are here at our disposal are far from being adequate to the task before us. Too many charitable sacrifices are still demanded here daily for the Russian poor, aged, and sick, widows and orphans; nor has the public fully learned to appreciate the importance of preserving, expanding, and multiplying the Jewish agricultural colonies in this land of unlimited religious freedom and boundless activity.

We, therefore, address ourselves to you with a petition for help and co-operation. We know there is no lack of sympathy for this cause in the circles in which you move and your philanthropy acts; but the position of affairs here, the difficulties under which the Russian refugees labor in this country, the noble efforts of some of them, and the expectations for the common weal of the Jewish people which can be based on such attempts cannot be sufficiently known in your country, and we deem it our duty to contribute toward a clear elucidation of them. The whole of this movement for self-regeneration, to which old degradation, disappointed hope of deliverance through freedom in the fatherland, and a barbarous persecution have given rise, is an entirely novel, a magnificent, phenomenon in the history of modern Judaism. By strengthening and fomenting this movement grand results can yet be achieved. And is it not a duty, is it not commanded by the said circumstances of the time, which has witnessed such a terrible revival of mediævalism, to make a vigorous effort to foster the good which so unexpectedly springs from a source of evil? And does not our Republic offer the best and broadest field for such efforts of Jewish philanthropy and foresight?"

Russian-Jewish Colonies

A year later, October 25, 1884, the New York *Evening Post*, in an article on the Montefiore Agricultural Aid Society, commented upon the surprising fact that the scanty means of the Society proved sufficient, and that none of its colonizing enterprises had failed up to that time, while others, undertaken with ampler resources, had proved abortive. This favorable result, as the article justly pointed out, was mainly due to the freedom in the choice of the *personnel* which the smaller volunteer so-

ciety enjoyed, while the Hebrew Emigrant Aid Society was oppressed by the weight of its daily duties and the care of a motley mass of refugees clamoring for bread. The rule of the Montefiore Society was to select for agriculturists only earnest young men and small families, and to help only those able to help themselves. It will be of interest to recall some of the characteristics of these colonies. The Montefiore Aid Society never endeavored to make converts for any religious or social doctrine. Its object was to foster agricultural pursuits among Jewish immigrants; but it left the choice of place and the internal organization of each colony to the settlers. It held no lien upon the property furnished to the colonists, relying for its reimbursement only on the honor of the colonists, if success crowned their efforts. Every settler was at liberty to leave his post without explanation or notice. New Odessa was the only colony based on communistic principles. There was a great variety of religious views among the colonists. Mutual toleration existed everywhere, in spite of the diverse elements that made up some of the colonies. Orthodoxy prevailed at Carmel, and a glowing racial spirit animated the colony at Montefiore.

The first of all the Russian-Jewish colonies had been started independently of the Montefiore Aid Society. Its leader was Herman Rosenthal, one of the most prominent of the men who left Russia in 1881. The ill-chosen site of this colony, in Catahoula Parish, Louisiana, on the Washita River, made its failure inevitable. Mr. Rosenthal, who later became a highly valued colaborer of Mr. Heilprin in colonization matters, was, after returning from Louisiana, the leader of the colonies in southeastern Dakota; these, after two or three years of relative prosperity, presented, in the winter of 1885–86, a gloomy picture. Failure of crops, and insufficiency of means, had done their fatal work, and the number of colonists had dwindled to a handful. In vain had Mr. Heilprin tried to infuse new life into the discouraged colonists; himself in impaired health, as the result of his superhuman efforts, he was compelled, in the spring of 1884, to leave New York and seek comparative rest and retirement in the village of Summit, New Jersey, in a region whose natural beauty had long attracted him. But even there he was pursued by anxiety for the fate of those in whom he

had taken such a deep interest. Equally with him, Dr. Julius Goldman retained his zeal in the cause during all the years when every nerve had to be strained to provide for the needs of the newcomers, as well as of those who, heartsick, returned from the colonies, and cast about for new means of subsistence. During the early days of the immigration, when bright hope animated the choicest spirits among the Russian Jews, and when Mr. Heilprin's own enthusiasm was at its height, Emma Lazarus, a gifted poet and noble woman, was an untiring advocate, in pen and person, of the cause of colonization. Mr. Jacob H. Schiff, among other prominent Hebrews, actively aided Mr. Heilprin's labors. Among those of another faith, Mr. Henry Villard, whom Mr. Heilprin had long known, furthered the cause of the refugees by securing for them cheap transportation to Oregon.

A Great Service to the Jewish Cause

Only four years more were vouchsafed to Mr. Heilprin in his rural abode. He had never cherished any illusion as to the price he had to pay for his share in the interest of his unfortunate kinsmen. His health was shattered, and in spite of his habitual cheerfulness, his spirit saddened. But he was able to render a last and permanent service to the cause of Judaism. The American Minister to Turkey, Mr. Oscar S. Straus, wrote to Mr. Heilprin, in the winter of 1887, suggesting that a full statement from him concerning the condition of the Russian-Jewish immigrants in the United States might influence Baron de Hirsch in extending to them his wide benefactions. Mr. Heilprin's reply, written in January, 1888, four months before his death, was as follows:

"Everyone interested in the fate of our race will rejoice at the thought that the noble enthusiasm which so recently inspired the grandest act of benevolence recorded in the annals of history is animating the benefactor, after spreading his blessings over the East, to look for a new field of blissful activity beyond the western sea.

America is rich in resources, wealth, energy, and freedom,

which is creative and fertilizing. Those Israelites who have found here their place require no help from abroad, no foreign direction, nor encouragement. But a score of thousands of their brethren are wafted every year to the shores of this country, mostly in a helpless condition, and many of them have to pass through an ordeal of misery and despondency before they find their place. There aid, encouragement, and direction are needed, but very scantily forthcoming. The new immigrants are not greeted with open-hearted sympathy by those who preceded them, but looked upon with more or less aversion, as intruders, likely to add to the unwholesome elements of the population.

Nor are the suspicions unfounded. The mass of the new immigrants came from countries in which the Jews are cramped in their development by mediæval restrictions and superstitions, internal as well as external; they bring along a load of ignorance, uncouth habits, and crude notions — partly obsolete and partly most modernly destructive — which apparently unfits them to become useful and successful members of society. The large fund of intelligence and ardor for good which many of them carry with them is generally overlooked, or rather remains long unperceived. The stream of immigration is constant, and there is fear of its ultimately swamping the goodly earlier settlements of Israel in the New World.

The prejudice and the fear are both exaggerated. The American Union could harbor all the seven or eight million Jews that there are in the world, and absorb them all in a harmless way. But not only does the selfish or patriotic susceptibility of the already established Jews revolt at the thought of such a consummation, but the most philanthropic and enlightened observer must desire that the influx of Jews from Europe be moderated instead of accelerated. Only thus could the boundless amount of suffering to which immigrants *en masse* fall a prey be obviated, and the necessary process of assimilation, after healthy distribution, take place.

But, unfortunately, the only natural check to precipitate immigration is that very suffering, the news of which is carried by letters or by returning emigrants to the countries from which the flood springs. To establish large institutions promising to

[illegible]remuous, and shelter and care [illegible]o the evil, instead of diminish- [illegible]such institutions might be — [illegible]bove alluded to has taught us [illegible]antic scale — their alleviating [illegible]to the increase in the demand [illegible]their existence would create. [illegible]successfully aided, a thousand [illegible]deceptive hope of help, which [illegible]d to the least fit to struggle for [illegible]nown, for instance, that work- [illegible]for Jews from Russia, Galicia, [illegible]ong and energetic young man [illegible]eddling or despair, a score of [illegible]ience and ability, would wend [illegible]r Botusharry to Hamburg and [illegible]that land and implements are [illegible]rists, and there will be a new [illegible]resulting, after a multitude of [illegible]ight direction but without the [illegible]n to the peddling population of

[illegible]justly been praised — perhaps [illegible]Antisemites would hardly dare [illegible]ing a great deal of good. But [illegible]d consequences. It has fostered [illegible]duals and congregational insti- [illegible]ened the instincts of manliness, [illegible]me to moderate this deleterious [illegible]d practice. Jewish institutions [illegible]nciple of aiding those who aid [illegible]warding independent efforts and [illegible]and distinctions, but by afford- [illegible]pe of honorable efforts and the [illegible]ot mean the widening of the [illegible]t too wide already among us. [illegible]olars, politicians, 'doctors' of [illegible]ers. I mean the promoting of [illegible]t is to achieve a livelihood and

respectable position among honest fellowmen by the diligent and useful labor of their hands. Let such aid be granted to mechanics and especially agriculturists as would enable them to extend the scope of their labor, and ultimately serve as encouraging examples to beginners in the same lines. A bank of credit which would advance to men established by their own efforts, and able to prove a tolerable advance in their occupations, sums sufficient for the purchase of better tools, implements, machines, teams, cattle, etc., than those with which they work — on good mortgage and at the lowest rate of interest — appears to me the most important desideratum. Numberless families now relying on labor which is but a drudgery without a prospect for the future, and constantly tempted to look for a more profitable though less honorable employment, would by such help be strengthened, encouraged and finally made prosperous. The prosperity of the thus assisted would lead others to follow in the same paths of manly activity.

Agriculture is the field of labor for which the Jew is least well prepared, or rather fitted by education and example. It is needless to state the reasons why this is the case. The whole history of the people in its dispersion proclaims them. But nothing is more desirable than that a large number of Jews should be, not induced, but helped to follow agricultural pursuits. Inducing to do it by promises or direct pecuniary aid would be but multiplying victims of delusion and cruel failures. There are, however, numerous immigrants in this country who can hardly be kept by warnings from making risky attempts at farming with their own scanty means. It is especially the Russian portion of the Jewish immigration which contains really available material for agricultural colonies. There are thousands of Russian immigrants who loathe peddling and all kindred occupations, and nourish even an exaggerated view of the excellence of farming labor and farming life. Of the various colonies founded by such Russian volunteers, a few have succeeded, and these ought to be extended by advancements of means to their best deserving members in the shape of well-secured loans. They are even now expanding by constant accession of unaided volunteers, but the natural inner development is retarded by scantiness of means. In the neighborhood of

these colonies — and especially of Alliance and Carmel in New Jersey, whose proximity to Philadelphia and New York renders them particularly important — considerable tracts of land ought to be acquired by the institution above referred to, or by a separate kindred establishment, in order to secure land, at the low present price, to the relatives, friends, or other imitators of the successful settler. Nobody should be encouraged to come and settle, but those who do come both with means and a fixed determination should be helped along, without becoming recipients of gratuities.

All gifts to individuals, because engaged in the occupation which is to be fostered and propagated, ought to be strictly excluded from the programme of the benevolent institutions here contemplated, in order that the Jewish agriculturist should be made to feel and consider himself a self-sustaining cultivator of the soil, and unsupported member of society. There are, however, common possessions of a settlement which, without impairing the self-respect of its members, may be fostered and enlarged by contributions from without. Such are the school, a library, a hospital, or a benevolent institution in aid of widows and orphans. The settlers ought to create all these themselves, but their creations will unavoidably be slow and insignificant, and the sooner they are developed by donations of sympathizers, the more attractive will the settlements become to their Jewish neighbors or occasional visitors, who may be inclined to exchange the garret or basement of the city for the log-dwelling of an agricultural colony. The appointment of teachers and physicians, and the spreading through them in the colonies, and through pamphlets and periodicals among the immigrants generally, of the most useful knowledge and information (especially as to agriculture) would also be an important task.

Experience has shown that only such Jewish immigrants can subsist on farming alone who begin with ample means and are armed with uncommon energy and patience. Such are, however, rare exceptions. The others who have succeeded owe their better luck to assistance or industrial labor in the house. Success by assistance, as I have stated, can no longer be our object. To help the agriculturist by making it easy for him to employ profitably the days or hours in the family which are not em-

ployed in the field is, probably, the best that can be done for him. Sewing on machines for factories or stores is diligently practiced in Alliance and Carmel, and the latter colony — which has grown up completely in the shade — in fact mainly relies on this resource. Let in every settlement one or two factories be established, capable of employing one third of the hands available for work — including women and boys — and almost general prosperity will be insured. Such establishments, however, must exist and be kept up completely on business principles, free from all interference by the settlers, and bound to them by no kind of promises. Successful settlers might, by advances of capital, be aided in creating minor establishments themselves. Their activity and enterprise ought to be spurred on in various ways. The industries that could be introduced in colonies not remote from large, and especially manufacturing, cities are very numerous. It would, in fact, be the greatest boon for such centres of industry, harboring large numbers of Jews, to have a Jewish agricultural-industrial settlement in their neighborhood. But these must grow up by independent effort. To develop, not to create them, would bo the task. This, at least, ought to be the rule. Experience might possibly suggest deviations from it, and teach different methods.

If we could imagine a small homogeneous committee of perfectly responsible, well-intentioned, and energetic men to be formed for a lengthy period of time, and supplied with ample means for carrying out, by successive attempts, the best enterprises that would suggest themselves for the lasting benefit of Jewish immigrants in this country — with due regard to the interest of the country itself, and particularly also of its general Jewish population — the conclusion would be natural that such a body ought not to be hampered by regulations and schemes laid out in advance, and that its own experience and the wisdom it would teach ought to be its only guides. But is such a creation possible while the most responsible among us have no time, and the best-intentioned no experience, and energy in this field is without the stimulus of success already achieved? Woe is me! The older I grow, and the more I see and think and read, and try to act, the more depressing becomes my pessimism in Jewish matters. But the worse the conditions are the more urgent is

the need of effort, and the more glory will redound to him to whose initiative great exceptional good will be due."

The establishment of the Baron de Hirsch Fund in America, with an original endowment of two and a half million dollars, later on increased to four millions, and its vast agencies for benefiting the Russian Jews who have since poured into this country, was the direct result of Mr. Heilprin's letter to Mr. Straus. Of the details of this work, which is being carried on to this day, this is not the place to speak. It is, however, worthy of record that at least one of the colonies whose inception was due to Mr. Heilprin, that of Carmel, in New Jersey, is still flourishing. To it may be added the allied three sister colonies in that State — Woodbine, Alliance, and Rosenhayn. And throughout the land thousands of Jewish farmers are living proof that Mr. Heilprin's faith in the ability of Jews to become successful agriculturists was fully justified. The report of the Jewish Agricultural and Industrial Aid Society of New York for 1911 shows that the members of the 45 Jewish Farmers' Associations in the States of New York, New Jersey, Connecticut, Massachusetts, Pennsylvania, North Dakota, and Washington, number 2428. There exists, besides, an active "Federation of Jewish Farmers of America." The Society referred to has since its organization appropriated for loans to farmers the sum of $1,256,000, and these loans are distributed over 27 States, besides Canada.

XV

ILLNESS AND DEATH

In the middle of April, 1888, Mr. Heilprin fell ill with an attack of pneumonia, which his weakened constitution was unable to withstand. He realized that the end was approaching, and faced it with philosophic resignation. On the 10th of May he breathed his last. The funeral was as simple as he would have wished it. There were no religious exercises, but Dr. Goldman and Mr. Garrison spoke of their friend in fitting words.

Several years later Mrs. Manning gave the family a letter from Mr. Garrison to her daughter, Mrs. Sarah Sage, which describes the funeral. It is dated "The Park [Llewellyn Park, Orange], May 13, 1888."

"You will have learned from other sources of the death of our old friend Heilprin on Thursday last at his home in Summit, N. J., some ten miles from here. He had been losing ground visibly for a number of years, ever since his excessive exertions on behalf of the Russian Jews, expelled by persecution, who came to this country with expectations of free farms and other milk-and-honey gifts from the Government. He had hardly extricated himself from this self-imposed burden at the time of your father's death, and the tone of his system was so much impaired that he could not resist the attack of pleurisy to which he finally succumbed.

It was very gratifying to me to be asked by the family to come and speak at his funeral. They were desirous to have neither a Jewish nor an anti-Jewish service, so did not call in either Dr. Adler or Mr. Chadwick. They allotted to me some remarks on Mr. Heilprin's learning and literary life; to a Dr. Goldman (if I caught the name right), a brother-in-law of Dr. Adler, a general discourse on his moral qualities, and in par-

ticular some account of his self-sacrifice for the Russian Jews. This programme was carried out yesterday to the letter, without the aid of music or any formality whatever, but I believe to the general acceptance.

The Heilprins, including the married daughter Mrs. Pollak and her family, live comfortably but plainly in a house surrounded by grounds in the heart of the village, which, though on high ground, as its name implies, is here a plain. There was a large concourse of friends and relatives. Mrs. Heilprin was greatly overcome, . . . indeed the intellectual partnership between herself and her husband — she reading aloud to him through all the years when he was forbidden to use his eyes — was as close . . . as can very rarely subsist between man and wife. Professor Angelo Heilprin was there from Philadelphia. The Franklins from Baltimore were unable to attend.

It was wisely decided to bury Mr. Heilprin where he fell, and the body was taken to a country cemetery near by, on the side of a hill commanding a lovely prospect over the valley of the Passaic. The air was full of moisture, and a haze hung over everything, partly heightening the charm, but rather, I fancy, concealing the best features of the landscape, which was quite new to me. No words were spoken at the grave, but a Jewish (and German) custom was observed of the relatives themselves throwing each a spadeful of earth upon the coffin.

Though every acquaintance of mine not formed before I left Boston seems new to me, Mr. Heilprin and I have been friends for nearly half my life; and if I feel bereft on the spiritual side, I also deeply feel the loss of one on whose scholarship I so much depended when out of my depth, and whose devotion to the *Nation* was the warmest I have ever known. We shall attempt to pay a just tribute to him in the *Nation* of next week."

XVI

HOME LIFE AND PERSONAL CHARACTERISTICS

It has not been possible, in the narrative so far given, to enumerate the intimate traits which alone reveal the inner man and endear him to those with whom he passes his days. Rare it is, indeed, to think of one who has left us, without having the cherished presence momentarily clouded by the recollection of something in his life we would have wished undone or unsaid. No such shadow rests upon Mr. Heilprin's life. It was, to those around him, always serene and reposeful. An atmosphere of stimulating cheerfulness went with him wherever he was. Few men enjoyed the simple pleasures of life more than he did. The beauties of Nature lay ever outspread before him. A fine sunset, a pleasing landscape, thrilled his heart in his old age, as they had done in his youth, and they were his solace in the hours of trial and sorrow. And were there not, daily, the pleasures of home life? Was there not the cheery talk with wife and children, the community of interests with them all in the great and little concerns of the world? Were there not, after the day's work was over, the favorite novelists — Cooper, Scott, Dickens, and others, read aloud by one of the children, while all the others of the family listened and shared his enjoyment? And, lastly, were there not the unfailing feasts of the table, which he enjoyed with such keen relish and such appreciative laudation, though others might have looked askance at the uniformly recurring eggs at the noon and evening meal? He was no Puritan, and though there was rarely wine at his own board, he could, on occasion, grow enthusiastic over a glass of good wine, especially Hungarian wine, at a friend's house. Tobacco he never used, and cards, in the years I knew him, he never touched, but he enjoyed sometimes a game of chess, which he played more than fairly well. He loved to see

visitors at his house and was merry with the young. In talking with little children — not only his children's children, to whom he was the most devoted of grandfathers — a quivering of the lower lip betrayed his deep affection. On Sundays, as long as he lived in the city, there were often many visitors at the house, and any friend, young or old, was made welcome at the simple supper, without preparation or notice.

Such a home life would not have been possible without a wife who met all his requirements. Henrietta Heilprin, though not a strictly learned woman, had something of her husband's aptitude for languages and was keenly interested in all his literary pursuits. She spoke four languages — English, German, Hungarian, and Polish — fluently, though not absolutely faultlessly, and read also French. She was a woman of native grace and dignity, and in her youth very beautiful. Her management in matters of domestic economy was wonderful. There was never any appearance of straitened means in any department, and there were always flowers and bright bits of ornament in the home. Mrs. Heilprin retained her serenity and her interest in the world's doings until old age. She died July 1, 1899, in her seventy-ninth year.

Mr. Heilprin's educational methods partook of the simplicity of all the ways of the household. Gently led, the children responded to the suggestions of their parents with cheerful alacrity. There was practically no direct teaching. The nearest approach to systematic instruction given them was, for a brief time, a little Hebrew, imparted by means of a blank book, in which the father wrote simple words and phrases in Hebrew, German, French, and Hungarian. Girls and boys alike picked up languages very much as their father had done in his youth (though they never began, as he generally did throughout his life, the study of a new tongue by reading the Bible in it), but they had the advantage of frequent practice, in reading to him — who rarely used his own eyes — now a French book, now a German, now a Spanish or Italian one. One bit of information led to another, and the gaps were filled without visible effort. When his sons had reached the age of sixteen and fourteen respectively, he found, on a certain occasion, their knowledge of some parts of European geography rather defective. A hint

was sufficient. From that day on geography became that serious study to them which bore fruit, in the case of both, in an encyclopædic knowledge of the earth's surface. There were no rewards, as there were no punishments, in this plan of education, but there were often great treats for the children. Besides little excursions into the country with them, there were a few trips, on a larger scale, carefully planned weeks beforehand and enjoyed in recollection years afterwards — such as a journey with the boys, largely on foot, through New England. There was, often and often, barely money enough for the necessities, but for the luxuries — books, excursions, lectures of unusual attractiveness — and, above all, for charity, funds were always forthcoming.

Mr. Chadwick has spoken of Mr. Heilprin's phenomenal powers of conversation. But nothing was further from his mind than an ostentatious display of knowledge. He simply could not help being eloquent, and he was naturally communicative; but the social or intellectual standing of those with whom he conversed made not a particle of difference in his attitude. He was as amiable to a needy stranger (and there were many who found their way to his home, both in New York and in Summit) as he was to a learned professor. More than once he left an unfinished article, to hurry away with some Polish or Hungarian laborer, unable to speak a word of English, who was in some trouble, and had appealed to him to straighten out matters with his employer.

The life in Summit he grew to be very fond of. He was a good neighbor, as he had always been everywhere, and he considered it his duty to identify himself with the place in which he lived. He attended public meetings and took an interest in all the concerns of village life. The good name of Summit as an orderly and cleanly place was a matter of importance to him, and he warmly seconded all the efforts of the Village Improvement Society. I remember seeing him on one occasion, when one of the paths was littered with stray paper, pick up each bit and deposit the lot in the proper receptacle. All this was done without ostentation. Respect for authority and strict obedience to law were part of his nature, but he could make every allowance for the weaknesses of others, and never im-

posed upon them his own stricter notions of propriety. He had a good deal of worldly shrewdness in dealing with men of all sorts and conditions, and his advice in practical matters sometimes proved very sound.

Though he spent a portion of every day at the writing table, he rarely overworked, and he never worked feverishly. He had an unfailing resource against mental fatigue in his ability to command, almost at will, brief naps. He would lean back in his chair, just after writing an article, and doze off in an instant. When meditating he would walk up and down in his room, humming his favorite lines, from *Childe Harold:*

> Yon sun that sets upon the sea
> We follow in his flight:
> Farewell awhile to him and thee,
> My native land — good-night!

Perhaps the verse recalled distant scenes in his own life, possibly the lines expressed an occasional longing for Poland and Hungary, which he was destined never to see again. Though not musical, he was very responsive to simple melodies, and Hungarian music fired his heart even in old age.

It is not strange that his closest friends should have been those with whom he had in common the love for Hungary, but he endeared himself to a wide circle of friends in his adopted country. Mr. Chadwick he met first at Mr. Manning's house, where there was an occasional gathering of choice spirits. Through the Mannings Mr. Heilprin became also acquainted with Professor E. L. Youmans, and with Samuel Longfellow — brother of the poet — Mr. Chadwick's predecessor in the Unitarian pulpit in Brooklyn. He knew Horace Greeley, as he did Goldwin Smith, Professor William C. Russel, Vice-President of Cornell, and Professor Child, of Harvard, with whom he once spent a day at Cambridge, in order to give him the benefit of his information in matters connected with Slavic folklore.

Among the prominent Germans who, after 1848, found a refuge in this country, Mr. Heilprin knew well Carl Schurz and Hugo Wesendonck. He came into pleasant contact with a number of these through his connection with the "Namenloser

Verein," an informal club of chosen men which met, in the sixties, in New York. Carl Schurz occasionally attended the meetings of the club; other members were Friedrich Kapp and Dr. Löwe-Kalbe, both of whom later achieved distinction in the parliamentary life of united Germany.

Though not a willing letter-writer, Mr. Heilprin kept up an occasional correspondence with a few old friends on the other side of the ocean, among them Fabius Mieses of Leipzig — a name of considerable repute in Jewish literature. Throughout his life he retained his interest in the doings of such notable representatives of Jewish learning as Graetz, Geiger (whom he had known personally), and especially Zunz, the Nestor of Jewish scholars, whose attainments and methods he greatly admired.

Of the learned Hebraists of this city Mr. Heilprin knew longest and best Dr. Samuel Adler. Another warm friend was Dr. B. Szold of Baltimore. He undertook, after Mr. Heilprin's death, to edit the Biblical Notes, dating from his earliest youth, which were found among his papers. They were privately printed, in Hebrew throughout, as *Bibelkritische Notizen*, with a preface in German by Dr. Szold, in which, addressing himself to Biblical scholars, he expressed his hope that, "in a skilful hand, what is offered here may develop into a complete and important work, and that even in their present shape these notes would prove most stimulating to scholars in this field."

With all of Mr. Heilprin's fondness for congenial companionship his most constant friends were his books. In reading for pure pleasure he often turned to some favorite of his youth and early manhood. "Anastasius Grün" (Count Anton Auersperg), the liberal singer of Austrian Germany, was one of these. In prose and poetry alike he looked for simplicity and clearness. The mocking spirit in literature, however allied to genius, he disliked, and he abhorred, like Goethe, caricature in any form. His reverence for the Humanists, in the broadest sense, remained undimmed. Among German classics, he was most familiar with Lessing, Mendelssohn, and Herder. Mendelssohn's *Phädon* (On the Immortality of the Soul) he placed more than once in the hands of friends called upon to confront a sudden bereavement. But he did not mean to convey thereby his own faith. What that was he never made the subject of

conversation, but all who knew him knew also that creed meant as little to him as race or nationality when the claims of a common brotherhood in suffering asserted themselves. Though most tolerant, in the broadest sense of the word, his mild blue eyes could flash indignation against flagrant public or private wrongdoing. He would never forgive the offences of Grant the President, however much he admired the deeds of the General. Of all men in our recent public life, Cleveland most fully won his heart. The memory of Lincoln he worshipped. Of his standards in matters of belief we sometimes catch glimpses in his writings, as in the following passage from a review of "Contemporary Portraits" by E. de Pressensé, the eminent representative of conservative French Protestantism.

"Like Vinet, M. de Pressensé is 'as impatient of the yoke of intolerant orthodoxy as of that of the hierarchy,' and does 'not find the truth embodied in the form of a *systematic creed* even in the Bible itself, which speaks with supreme authority on matters of faith.' It is perhaps needless to add that he condemns Bismarck's *Culturkampf* almost as much as the dogmatic enunciations of Pius IX. M. de Pressensé is thus a zealous champion both of faith and freedom; and his championship is marked by the best moral qualities of a leader: ardor tempered by toleration, partisanship restrained by charitableness. The last-named virtue, however, is perhaps too far stretched in some of his biographical sketches. His 'Thiers' is all but a panegyric, although the founder of the French republic was never a model of a Christian, and only in his last years an advocate of republican liberty; and Voltaire and Dupanloup — men of the most antagonistic tendencies, though of tendencies equally repugnant to the author — are judged with a mildness which the mere admiration of genius and *esprit* does not sufficiently justify. Strauss alone, the assailant both of Christianity and France — of the latter in 1870 — may be said to be treated without favor, though also *sine ira*. The spirit that pervades the whole book is noble, the style is beautiful throughout, and the light thrown upon the evangelical movements of our age — especially in France, Switzerland, and England — must be welcome to thoughtful readers of every shade

of religious opinion. The philosophy, however, which underlies the Christian speculations of the author must be said to be merely a philosophy of sentiment. His dogmas are based neither on logical nor on historical deductions; they grow subjectively out of his conscience and pious reverence."

We have in this extract the reflection of Michael Heilprin's own character — with his tolerant liberalism and his insistence on truth, logic, and accuracy. His entire life was the best exposition of his religion and philosophy. He lives in the fond recollection of those who knew and loved him, who daily admired the loftiness of his motives and the unvarying sweetness of his disposition, who were under the spell of his fiery eloquence, who beheld in him the pure patriot of two continents, the scholar of unrivaled attainments, with a heart for the humblest fellowman, whatever his race or faith.

Part II

ANGELO HEILPRIN

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ANGELO HEILPRIN

I

HIS EARLY LIFE

Angelo Heilprin was born at Sátoralja-Ujhely, Hungary, March 31, 1853, and came to this country with his parents in 1856. He received his first schooling in Philadelphia and Brooklyn, and attended for a year a grammar school in Yonkers. His early interest in nature was stimulated by a Hungarian book on animals, Raff's *Természet-Historiája*, a gift of the Kossuth family, which his parents had brought with them to this country. From their earliest years Angelo and his brother Louis were inseparable, and they shared alike their studies and their pleasures. Drawing and painting with simple water colors was one of their favorite pastimes. Angelo turned to a much more ambitious artistic task when the family moved to Washington. It was nothing less than the copying of some of the paintings in the Capitol, among others the "Marriage of Pocahontas." The boy of ten sought and obtained permission to sit in the rotunda for this purpose, and often attracted attention by his patient work amid such surroundings. In his own room at home he adorned the walls with frescoes from his sketches. Nothing, of course, is left of these youthful efforts, but they linger in the memory of those who saw them as quite remarkable.

In Yonkers, at the age of twelve, and during the following year, Angelo received some instruction in piano playing, for which he developed a great liking. Though a most obedient child, he early showed that spirit of independence of which he was later to give so many striking proofs. When, at the age of thirteen, he was told by the family physician that, on account of a temporary weakness, he ought to desist from

HEILPRIN

knowledge of his parents, to for a little freedom in the At the age of fourteen, when he, together with his brother, where they used every leisure amiable employer, in studying and the evening hours at home us subjects, — history, travels, the study of foreign languages ounced bent toward the acquisi- ended faithfully to his office rtant position in a larger mer- ered in 1871. He was offered llowing year, but he had long naturalist. The evening hours of serious works on scientific geology, and biology. Some of o him, while he was suffering es. The revision of the Ameri- father in 1873, gave him the doning mercantile pursuits, and m of 1876 he assisted his father s brother and sisters. During dy of the natural sciences with ully dissected a fowl, collected in his excursions had an eye tural objects. Nor was his in- r. One day a block of marble t of which he proceeded, with hion a lion, for which he had model in Central Park. If not t and only attempt at sculpture g man's versatility and his skill et out to do.

THE AMERICAN CYCLOPÆDIA

e modestly asked to be allowed w articles on scientific subjects.

Being given permission by the editors-in-chief, he produced several striking biographies, of which the one on Tyndall is the most important. It was a summing up, from a careful reading of Tyndall's works, of his achievements in physics. The article was submitted, in proof, to Professor Tyndall himself, who expressed to the editors his great satisfaction with it. In this biography, the young writer said:

"The labors of Professor Tyndall, though more particularly directed toward the examination of the molecular constitution of matter, have not been confined to any special branch of physics. Between 1849 and 1856 he was mainly occupied with the prosecution of his experiments in magnetism and electricity, in the course of which he conclusively settled the question of diamagnetic or reversed polarity, the existence of which, originally asserted by Faraday, and reaffirmed by Weber in 1848, had been subsequently denied by the former. In 1859 he initiated a remarkable series of researches in radiant heat, which were extended over a period of more than ten years. The diathermancy of simple and compound gases, as well as of various vapors and liquids, was experimentally tested, and the degrees of their opacity to radiant heat determined with great precision. Dry atmospheric air, which had hitherto afforded but negative results to Melloni, was ascertained to have an absorptive power about equal to that of its main elementary components, and but a mere fraction of that of aqueous vapor; a discovery which, in its bearings on terrestrial and solar radiation, has exerted a marked influence on the progress of meteorology. The principle of the physical connection of the emission and absorption of undulations (first enunciated by Euler), which formed the basis of Angström's experiments on the radiation and absorption of incandescent solids, and which laid the foundation for the science of spectrum analysis, was applied by Tyndall to gases and vapors some time previous to the publication of Kirchhoff's more specialized generalizations respecting refrangibility. Tyndall's investigations on obscure and luminous radiations, and on the nature of calorescence, on the transmutation of heat rays, form some of the most noteworthy of his contributions to molecular physics. By means

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ELEMENTARY BIOLOGY"

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iar and vigorous style so characteristic of most of the author's writings, concise in statement and accurate in definition, it leaves little in the scope of the work to be desired. Though not sufficiently elementary in certain portions, and perhaps a little too abstruse in others, it is, on the whole, clear enough to be handled by anyone pretending to but a slight knowledge of the first principles of the science. Taking the common yeast-plant (*torula*) and *protococcus*, as forms exemplifying the simplest stage of vegetable existence, and *amœba* as equally illustrative of the lowest type of animal organism, we follow the professor in a minute examination of the microscopic cell and cell-contents, observe their mode of growth, reproduction, and decay, and note the interesting changes which they undergo under the direct influence of heat and light, or through the action of chemical agents. From the investigation of these primitive particles of organized matter — matter which may be almost said to be leading a passive or rather mechanical existence — we proceed to the consideration of the more highly constituted moulds (*penicillium* and *mucor*), plants consisting of an aggregation of homogeneous cells, and which, though showing a true differentiation into organs, still bear a strong affinity to *torula*. *Chara* and the bracken fern (*pteris aquilina*) illustrate a bi-sexual mode of reproduction among the thallogens and acrogens respectively, while the bean affords a familiar example of an exogenous phænogam. Appended to the brief but well-sifted descriptive text which forms the reading matter of the work is a course of instructions intended to carry the student through a series of microscopical researches into the anatomy and physiology of each subject, and which will, in the words of Professor Huxley, enable him 'to know of his own knowledge the chief facts mentioned in the account of the animal or plant.' The section devoted to zoölogy is treated in pretty much the same manner as that on botany. A number of well-known objects, easily obtainable in most localities (such as the fresh-water polyp, mussel, and frog), serve to typify some of the leading modifications of animal structure, and to represent at the same time the several principal classes into which the animal kingdom has been divided. Great space is allotted to the description of the frog, the details about that

worthy subject occupying no less than one-third of the entire volume, or more than 100 pages.

What is especially noticeable in the character of the present work is the complete absence of anything approaching a tendency to speculative theorizing, a remarkable circumstance in view of the number of important questions with which the author's name has been prominently connected. In one instance only do we find an allusion that may be regarded as having any bearing on one or other of the great biological problems of the day — namely, under *bacteria*, where a direct refutation is given to the experiments frequently brought forward in support of the theory of spontaneous generation. Objection might be made to the summary and positive manner in which this interesting question is disposed of, but the author had already fully stated his views on that point in his presidential address before the British Association in 1870. In the chapter on the bean, we are surprised to find no mention of that fact of primary signification in vegetable morphology, the correlation of the different organs of the plant — in other words, the intimate relation which the various parts constituting the flower and fruit bear to the leaf."

Studies in Europe

After the completion of the American Cyclopædia, in 1876, Angelo Heilprin, then in his twenty-fourth year, was able to carry out a long-cherished plan. He went to Europe to study the natural sciences under eminent teachers. Entering what was then known as the Royal School of Mines (now the Normal School of Science) he studied biology under Huxley, geology under Judd, and palæontology under Etheridge. His conspicuous ability won for him, after a year, the Forbes medal for proficiency in biology and palæontology. He then went to Paris and Switzerland, journeying through the Alps and studying glaciers, and, in the fall of 1877, settled for the winter in Geneva, where he attended the lectures of Carl Vogt. A journey to Italy followed, where he found varied inspiration. In Florence he attended, for a few weeks, a course in painting — the only instruction in the technique of art he ever received.

He then crossed the Alps on his way to Austria and studied for a short time at the Imperial Geological Institute of Vienna. Going thence to Hungary, he ascended some of the Carpathian peaks, and finally went to Russian Poland, where he spent six months with relatives. Even before his return to America, in June, 1879, Professor Huxley had written to both President Gilman and Professor Martin, of Johns Hopkins, recommending his young pupil in the warmest terms for a fellowship in the University. To Professor Martin Huxley wrote: "He was *longo intervallo* the best man in my class."

A letter from a friend in the University urging young Heilprin to apply for a fellowship failed to reach him, and he missed the opportunity.

Work in Philadelphia

On his return to America he decided to settle in Philadelphia, and there began his fruitful connection with the Academy of Natural Sciences. Of his work in that institution, its secretary, Dr. Edward J. Nolan, said:

"Without loss of time he took up the study of his chosen branch, Invertebrate Palæontology. His bearing was that of a modest, retiring and industrious student. He presented his first paper for publication in the *Proceedings,* October 21, 1879, under the title, 'On Some New Eocene Fossils from the Clairborne Marine Formation of Alabama.' He offered two others the same year, and the papers and reports of verbal communications published by him during his active connection with the Academy, from then until 1891, when his work began to take another shape, number forty-six in all, in addition to annual reports.

"He was elected a Correspondent of the Academy January 27, 1880, he then being regarded as a resident of New York, but deciding to remove permanently to Philadelphia, he was transferred to the membership list. He served as a Jessup Fund student during the latter third of the year, resigning that position on his appointment by the Council, December 27th, to the Professorship of Invertebrate Palæontology. He occupied this

position until 1895, when he was transferred to the Chair of Geology, which he resigned in 1899.

"He was elected a Curator October 2, 1883, to fill a vacancy caused by the death of Charles F. Parker, and was at once appointed Curator-in-Charge by the Council. He served the Academy in this capacity until the end of 1892.

"He at once began important changes in the arrangement of the Museum, and started the formation of a collection illustrating the natural history of Pennsylvania and New Jersey. He made a number of admirable suggestions, which it was impossible at that time to carry out because of the slender financial resources of the Academy. He advocated opening the Museum on Sundays, urged the formation of a Museum Endowment Fund and the erection of a lecture room. He organized a popular course of lectures in addition to those delivered by the professors. He prepared a hand-book to the Museum and gave most effective assistance in securing appropriations from the legislature in 1889 and 1891. Referring in the report of the Curators for 1892 to the operations of the Trustees and the Building Fund, and the progress made in the erection of an addition to the Academy, Dr. Ruschenberger says, 'for a large part of the means to enable the Trustees of the Building Fund to do this work, it seems proper to mention here, that the Academy is very much indebted to the ability and steadiness of purpose of Professor Heilprin, who several times visited Harrisburg and by his representation to members thereof, greatly contributed to satisfy the Legislature of Pennsylvania of the worthiness of the Academy to receive pecuniary assistance from the state. Possibly without the influence of his intervention, appropriations might not have been granted at that time.'"

II

VARIOUS BOOKS BY ANGELO HEILPRIN, BASED ON HIS CONNECTION WITH THE ACADEMY OF NATURAL SCIENCES

In 1884 Professor Heilprin published a volume containing a number of papers which had originally been printed in the *Proceedings* of the Academy. The book, which was entitled *Contributions to the Tertiary Geology and Palæontology of the United States,* was recognized as a valuable contribution to science. In the following year appeared the *Town Geology: The Lesson of the Philadelphia Rocks,* which contained the substance of the author's field-lectures to his classes.

In simple and picturesque language he illustrated such familiar texts as "The Rocks of the Schuylkill and Wissahickon," "White Marble Steps and Window Facings," "Brownstone Fronts and Jersey Mud," and "Philadelphia Brick and Cobble-Stone," interpreting by their aid the workings of Nature in the remote past. I quote from the chapter on "White Marble Steps and Window-Facings."

"If we take a chip of such marble and drop it into a vial containing one of the stronger acids, as nitric or sulphuric acid, for example, it will be observed that almost immediately a peculiar boiling or effervescence in the acid takes place, and that there is a simultaneous wasting away of our chip. The effervescence is due to the elimination by the marble of innumerable tiny bubbles of gas, which when collected and analyzed proves to be carbonic acid, the same that produces the familiar ebullition in soda-water. Evidently the marble has parted with some portion of its substance, but its final disappearance has not all been brought about in this manner, for we know that marble is more than simple gas. The rest of it has been taken up by the acid, and held there in solution, just as salt, dipped into water, is held by it in solution. But how do we determine what the

process is a very simple one. subject it by means of a mouth ficient to bring about incandes- have completely driven out the in the form of a white powder. be lime, oxide of calcium, the en slaking, in the process of ghborhood of building houses. of carbonic acid and lime, or, bonate of lime. This is also the e minerals known as CALCITE hell-fish, the skeleton or 'poly- of true chalk, although much of ficial compound. This prop- s possessed by most carbonates, t proves that the avidity of the greater than that possessed by sequently been driven out. The s a ready means for distinguish- n rocks of an entirely different s closely resemble them.

OF MARBLE

chalk, and marble may appear, cases, a common origin; they es. This is self-evident in the e remaining two. When, how- ly powdered chalk, and place under the microscope, it will be these particles possess definite which cannot for a moment be some globular, some spiral, and most cases to the order of ani- , about the lowest of the animal te form is not always recogniz- attered about indicate that *the* ndant, and that, as a matter of great bulk of the chalk *itself.*

Having determined this much, and reflecting that the deposits of chalk extend over an area of hundreds of miles in length, and measure in places hundreds of feet in thickness, it is no longer very surprising that marble, which in a general way resembles chalk, hardened through pressure, and which shows much the same chemical and physical reactions, should have a similar structure. It is true that most pieces of marble powdered and placed under the microscope present no such appearance as we have seen in the chalk; there are neither perfect nor imperfect animal parts to be determined, and, therefore, nothing to suggest an organic origin. On the contrary, even the naked eye will make out on the broken surface of a piece of marble the crystallographic faces of the mineral calcite, showing the whole mass to be distinctly crystalline in its formation. But it is now well known that marble is nothing but altered limestone — common limestone, in which, through the influence of heat and pressure, a true crystalline structure has been brought about. This being the case, it might be inferred that limestones which had undergone no material alteration in their parts would, when carefully examined, show distinct organic traces; the supposition is a correct one, for in almost every block of such limestone (at least when of marine origin) the microscope has revealed a sufficiency of more or less perfect shells, or other fragments of animal remains. It is concluded from this fact that all limestones, except such as may be deposited by fresh-waters, are of organic origin, and where, as in marble, no determinable organic traces are visible, this circumstance must be taken as an expression of the obliteration of parts rather than of their absence. And were any further proof of this position needed, it might be said that in many cases a distinctly fossiliferous, or non-altered, limestone can be directly traced into the crystalline, or non-fossiliferous, marble. Limestones occur in all grades of structure, from the coarse shell-rock, 'Coquina' — such as we now find forming along the Florida coast, where the component shells, or their fragments, are well marked out in size and character — to the fine-grained or compact varieties, in which, for the most part, the unassisted eye fails to distinguish individual forms. But few, if any, fossils have thus far been detected in the true limestones about

Philadelphia, a circumstance, doubtless, in great part due to the metamorphism to which the rock was subjected during the process of lateral crushing. It is by no means impossible, however, that in the less altered deposits the outlines of some lowly types of organisms may yet be revealed by the microscope.

Limestone Valleys

Perhaps the most striking physiographical feature in the region about Philadelphia is the long and narrow depression occupied by the limestones, known as Montgomery and Chester Valleys. Looking north from an eminence, like Chestnut Hill, the eye sees stretched before it a somewhat undulating monotonous plain, extending east and west to about the limits of vision, and across for a distance of some three or four miles. On either side rise elevations of moderate height, the rocks composing which are gneisses and sandstones, both on the north and on the south; the first rock to meet the limestone is the Cambrian sandstone, which dips beneath it along both boundaries, and consequently underlies the floor of the valley. The limestone rests on top, and is thereby proved to be of newer date. Although now occupying a comparatively narrow area there is every indication that at a former geological period it had a vast extent, and not improbably the sea depositing it stretched hence half across the continent. Being a rock readily soluble in water, it has suffered greatly through erosion, and has left to the geologist only a mere indication of its former development. How far it rose above its present surface it is impossible to conjecture, but there can be little or no question that it at one time covered the sandstone ridge both north and south of it, from which it has since been removed through the time-wearing action of water. The relation of rock structure to the configuration of the land surface, or what is the same thing, scenery, is here beautifully exhibited. The rock (limestone) most readily yielding to the disintegrating forces has suffered more waste than the rock (sandstone) which by its compactness and insolubility has been better able to resist the action of water; the one has weathered 'low,' whereas the other has weathered 'high.' These differences in the behavior of rocks, which underlie the

manifold aspects under which the landscape presents itself to our eyes, are a guide-line to the geologist, fixing for him the positions of rocks possibly far beyond the limits of his own personal examination. The generally flat appearance of the limestone valley, as seen from the hill-top, may lead one to suppose that the rocks composing it were disposed horizontally, and that little or no disturbance had affected the positions which they had normally assumed when first laid down. That such is not the case, however, can be proved in almost every locality where the limestone is exposed in mass; the strata dip at a steep angle.

Marble Quarries

About a mile due north of Spring Mill, and reached by the main road connecting Spring Mill with Plymouth, are Potts' marble quarries, where one of the finest exposures of rock in the entire valley is to be had. Almost immediately after leaving the station, just outside the mill, the road skirts for a short distance a stream of transcendent purity, whose presence has given the name to the locality which it feeds. In the meadows lying about a quarter of a mile from here on the left of the road, opposite to where a branch road leads off to Marble Hall, are located the 'Springs of Spring Mill,' whose inspection will well repay a *détour* of a few minutes. At numerous points here in the meadow springs, as clear as crystal, rise from clefts in the underlying rock, evidently forced up by pressure exerted from some higher ground. Observe the dancing mounds of sand and earth, thrown up by the force of liberated bubbles of compressed air, whose intermittent action recalls the work of miniature geysers and volcanoes. Rounded masses of 'trap' rock, derived from a volcanic dyke that runs to near, and beyond this point due east from Conshohocken, lie scattered about between the line of the main stream and the bounding fence of the meadow. Continuing on the high-road, which runs for a short distance over a region of micaceous slates (HYDRO-MICA SCHISTS), whose relations to the surrounding rocks have not yet, perhaps, been very clearly determined, we reach almost immediately the line of the trap-dyke itself — which here crosses the road as a prominent swell, and whose debris (boulders) are scat-

ILPRIN

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steep angle to the south, are
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On the opposite side of the
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Holes of considerable depth,
re first drilled into the rock;
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ARBLE OPENING

cluster of houses situated just
off to the Ridge Road, follow-
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most imposing marble opening
de Hall, derives its name from
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been quarried vertically from
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e lateral walls have been left
ible cave of the wall on either

side. Owing to the great expense necessarily attendant on the hauling of rock from such a great depth, the works have been for some years practically abandoned, and large quantities of water allowed to accumulate in the bottom of the trough. The effect of deep clear water (150 feet) in absorbing the rays of light is beautifully shown in the dark, nearly black, color, under which the surface appears, a condition analogous to that which distinguishes many small deep lakes of elevated mountain regions.

The most extensive of the excavations about here is situated a short piece back of the country store; another, considerably smaller, and containing more of the bluestone, may be seen a little lower down on the Barren Hill road.

The Rocks of the Wissahickon

Just south of Marble Hall, forming the boundary between the limestone and an adjoining narrow belt of slates (hydro-mica schists), is the line of the trap-dyke, which may be traced by its outcrop and a long line of boulders from beyond Mechanicsville, through Conshohocken, to this point, a distance of several miles. Following these boulders beyond Marble Hall for about two miles through the wooded slopes and over the open meadow we reach the Wissahickon, whose southerly course from Valley Green is deflected by the resisting barrier of trap, along whose northern face it flows for some distance, and then breaks through at a point shortly after crossing the Chestnut Hill-Lancasterville pike. The hard rock is seen to cross the channel of the water, and to continue beyond in a serial line of boulders of singular regularity. Observe the elevated rampart-like undulation of the meadow leading hence to the high-road, which marks the trap-ridge whence the boulders were originally derived, but which now lies buried beneath a capping of soil.

This most picturesque spot in the centre of the valley, whose air of quietude is only broken by the babbling of the brook, and the garrulous cawing of the crows in the tree-tops overhead, may be reached in about three-quarters of an hour from the toll-gate at the foot of Chestnut Hill by following the line of the Lancasterville pike. Immediately after leaving the gate we traverse

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permits it to reappear in a de-
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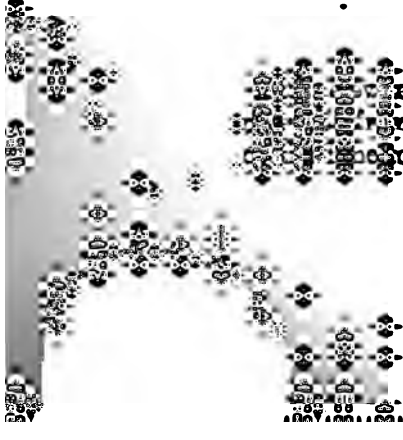

MATION

ch runs for some miles almost
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ch a prominent feature in the

landscape, marks the outcrop of the Cambrian quartzite. Here, therefore, as on the south side, we have the same distinctive separation of the rock of the valley from that of its boundaries. Continuing in the direction of Blue Bell we note a sudden and interesting change in the physiognomy of the country. The road we are travelling upon has assumed a reddish tint, which increases in intensity the further we proceed. Examined carefully it is seen that this red color is due to the powdering up of fragments of a shaly rock, quite distinct from the rock which we had last left. Evidently, we have struck a new formation, whose presence is indicated by the character of the superficial soil. For fully twenty-five miles across the country, and in a northeast and southwest line cutting completely across the corner of Pennsylvania and through the States of Maryland and New Jersey, this red-rock, known to geologists as the TRIASSIC shales and sandstones, extends uninterruptedly. Norristown is situated on it, and so are Bridgeport, Valley Forge, and Phœnixville. At almost every locality of its occurrence the strata dip uniformly to the northwest, and in many places they can be seen to rest upon either the Cambrian sandstone, or the valley limestone (Silurian), proving it to be of more recent origin.

Putting together the notes that we have taken in the field bearing upon the structure of the valley — say at about its middle part — and a little way beyond on either side, let us see what we can make of them. In the first place we have, beginning at the Chestnut Hill slope, the oldest of the rocks known in the region — namely, the Laurentian gneiss or syenite — which stand up nearly vertically, or decline somewhat in the direction of the valley. Following these, and resting on their northern flank, is the Edge Hill rock, or Cambrian sandstone, which dips beneath the limestone forming the floor of the valley. Just back of Williams' station this sandstone rises up in the form of a roll or arch (anticlinal), which separates the large basin-like depression, forming the valley proper, on the south from a similar, but much smaller, depression on the north. Over this roll the limestone strata of the valley were at one time carried in a continuous sheet, but the waste which the rocks have suffered through mechanical disintegration and chemical solution has actually lowered their surface beneath that of the much more re-

effect its continuation. From that time to this the region has probably been out of water, and has been undergoing those gradual modifications in outline which have resulted in producing its present features.

A "Fault" in the Rock

The exposures of limestone along the river front are numerous, and can be studied to advantage in the few miles that intervene between Norristown and Conshohocken. In the first cut south of Norristown, Mogee's, the strata, which alternate in beds of various degrees of coarseness, and in shades of blue, white, drab, and red, dip steeply to the south, measuring an angle of about 40°. Immediately on entering the cut we notice on the right a vertical split in the rock, the strata on the opposite sides of which are not absolutely continuous with each other. There has evidently been a displacement, by which one side was dropped a piece below the other. Just what caused this FAULT in the rock it is impossible to determine, but it is, doubtless, due to an existing tension in the mass. Although the amount of displacement, or 'throw,' of the fault is here very insignificant, indeed but barely appreciable, it is of the same kind as that which in many districts has elevated strata thousands of feet above their normal positions, or, as the case may have been, dropped them to the same extent. A more pronounced fault occurs in the red rock just beyond the further end of the cut, where the line of faulting, or 'hade,' runs diagonally across the beds. Observe that on the north side of the fracture the beds that have dropped are turned or 'brushed' up against the line of the fault.

Beds of "Blue-stone"

Continuing southward the beds become more and more compact, and are deficient in the sandy layers which are met with above. They evidently belong to deeper water than that which deposited the more northerly, or underlying, beds, and bear testimony to being deposited further from the shore-line. From a favorable point on the water a fine view may be had of the successive exposures following each other in the direction of Con-

shohocken, the strata in all cases dipping much the same way. The inclination of dip steadily increases, however, until at Conshohocken, where the limestone alternates with slaty layers, the angle measured is 60°. Back of the town, and directly opposite on the west bank of the river, a number of quarries have been opened, which furnish the well-known Conshohocken 'blue-stone,' so extensively used for building purposes, curb-stones, etc. Much of the marble of our city that we see in door-steps, and otherwise, is obtained from the valley deposits, although not a little, especially that used in window-facings, is imported from deposits of nearly equivalent age occurring in Vermont and elsewhere. It is a singular fact that the limestone of the valley has been converted into marble principally on the south side, whereas on the north it has been more or less impregnated with magnesia, forming a magnesian limestone, or DOLOMITE."

In another chapter, that on "Our Oldest Patch of Land," Professor Heilprin said:

"North of the line of the Philadelphia schists and gneisses, and extending from Trenton on the Delaware to West Chester and beyond, there runs a comparatively narrow belt of rock bearing in many points of structure a striking resemblance to the rocks which we have just been studying, but which, again, in many respects departs widely from them. The granites, syenites, and gneisses of this region, usually classed with the Laurentian series, are the oldest rocks of the neighborhood of Philadelphia, and represent practically the foundation rock of the continent. Throughout the greater part of their extent they define a prominent ridge, readily distinguishable in places as forming the southern boundary of the limestone valley lying to the north. The toughness of the rock and its resistance to erosion have combined to preserve it for a much greater length of time than the limestone, which, though of much newer date, yielding readily to the solvent action of water, has been reduced to a comparatively low level. We say that the limestone has 'weathered low,' whereas the Laurentian rocks have 'weathered high'; and it is this comparative weathering, depending upon the relative resisting powers of the rock-masses, which so manifestly controls the physiognomic aspects of the landscape. Were

it not that some rocks yield more readily to the disintegrating influences than others, the landscape would be devoid of those manifold charms which are lent to it by the various alternations of hill and dale, mountain and valley.

Granitic Rocks

A fine exposure of the Laurentian rocks is met on the new Sorrybell Railroad, beginning about one-half mile north of Lafayette station, and extending to Spring Hill. After passing the first road crossing beyond Lafayette, which approximately marks the boundary between the older and newer formations, the railway skirts the base of a hill along whose slope the rocks are well exposed. Almost immediately beyond the broad band of white granite which meets the eye on the right, we enter a region of dark or blackish rocks, whose peculiar color is due to the prevailing tinge of the minerals and to numerous dark-colored crystals or grains of hornblende. We note here, in fact, that the rock series of the Palæozoic series of rocks have in large part been derived by metamorphism; and further, that the rock-masses have rarely much less than foliated structure distinctive of gneiss and mica-schist, and that they are in a general way more decidedly granular in appearance. They are the most common hornblende schists, differing from granite in the subordination of feldspar to mica, and from gneiss in the absence of the foliated structure. The insensible gradation which we can trace with the naked eye may be seen by the polished edge of the rock, where in some cases the hornblende has completely disappeared, leaving the rock a coarse-grained granite, composed of quartz and flesh-colored feldspar. Still again, where the same granite shows a tendency to foliate, passing off into gneiss.

[illegible] seems to be the highest point of the hill, the rock is nearly vertical, although it is not a little different from the horizontal to determine that question with any positive [illegible]. At about the point where the strata first show a [illegible] inclination, the mica, the rocks assume what might be considered to be the typical Laurentian facies; [illegible] nearly equal parts of feldspar, mica, quartz and an

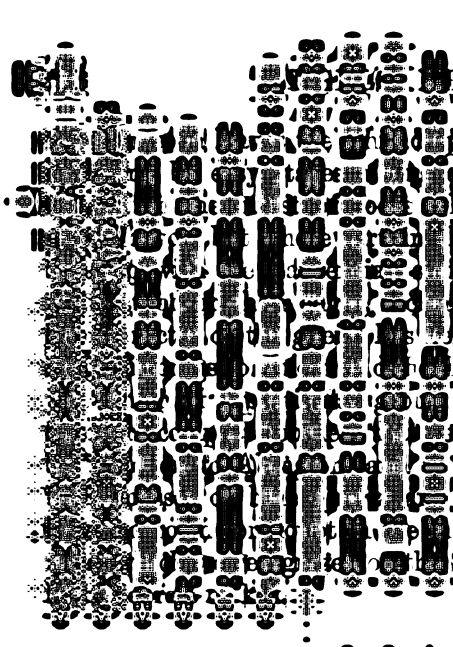
abundance of the black hornblende crystals. Old surfaces, on the other hand, are largely yellowish or brownish, due to the oxidation of the contained iron. Passing northward the inclination of the strata becomes less and less pronounced; through a series of gentle undulations they gradually assume the horizontal position, until, about 300 yards this side of Spring Mill station, they suddenly become highly plicated and contorted, recalling in their convolutions and general appearance the gneisses along the Wissahickon. Two or three rolls of rock, sharply defined by the curves of plication, stand out in prominent relief from the wall of which they form a part. From this point to Spring Mill, where the formation disappears, the dip is uniformly to the north.

Rocks of Uncertain Determination

The Laurentian rocks may be traced eastward from Spring Mill by following the line of the ridge a little below the crest, which is formed by the gneisses of the Philadelphia series. Over a considerable extent, however, their determination is made difficult or impossible from the scarcity of outcrops, and from the circumstance that in many places they are overlaid by the sandstones of a newer formation, the Cambrian, lying on the north flank. On the heights between Lafayette and Matawna and Barren Hill the nature of the underlying rock is indicated by the hornblendic boulders which everywhere lie scattered about, and by occasional outcrops of the rock itself. An outcrop of the blue beds occurs on the right bank of the Wissahickon, just where that stream enters the hilly country from the White Marsh Valley, not far above the last bridge which carries the road over to Chestnut Hill, and just beyond the now largely overgrown granite quarry.

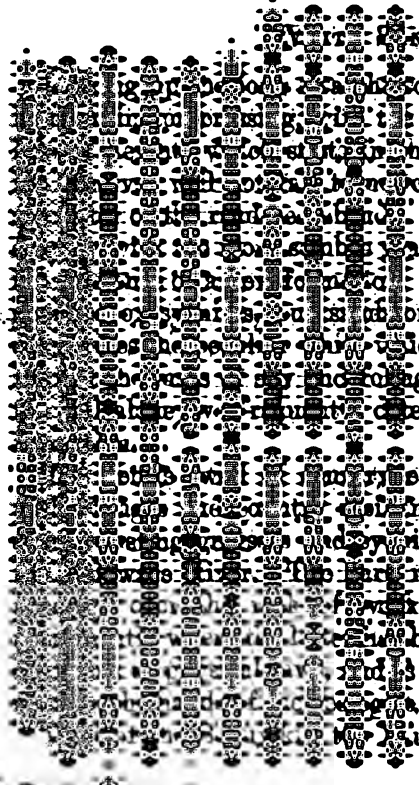
Laurentian Kin

Forming part of the northern declivity of Chestnut Hill, where, however, the formation is almost entirely hid from view beneath the capping of soil, the Laurentian reappears to the east as a rather prominent ridge flanking Edge Hill on the south. Passing north from Jenkintown, on the Abington road, the



EILPRIN

phia gneisses behind him, and
astwardly trending hill finds
here decomposition has made
haracters still betray the rela-
es. Opposite Mooretown the
ng slightly toward the south;
re so far changed through de-
t at first sight to determine to
of rocks it may belong. But
re and there lie scattered over
the heights of Hillside, with
dark crystals of hornblende,
atter, and clearly point to the
Schuylkill as Laurentian to be



NDSTONE

oad which leads off to the left
rays of the sun falling on the
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The rocks there are no longer
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termine the bounding line of a

eastward, picturesquely dotted
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ites in their trend (strike) to
rock everywhere asserts its su-
ker constitution, standing *out*
been washed away. Landscape
thus made a powerful instru-

urentian area steadily widens,

and overspreads a large part of Delaware and Chester Counties; in its general aspect it presents the same features as the region to the east, and therefore requires no special consideration. The prominent wooded ridge, whose reflection is cast into the river opposite Spring Mill, and whose noble outline seems worthy of a more picturesque foreground than is constituted by the red roofs and black chimneys of busy Conshohocken, marks the passage of the belt across the Schuylkill.

Evidences of the Existence of Early Life

The Laurentian being the basement or foundation rock of the region about — *i. e.*, the oldest — we would naturally look for its fragments in rocks of newer date, or such as must have derived their materials primarily from the destruction of this series. All mechanically formed rocks, whether they be gneisses, schists, shales, clays, or sandstones, are built up from the materials of previously existing rock-masses, and must hence contain in their own substance the substance of the parental rock, or that from which they were born. And where no special alteration has taken place the derivative ingredients of the one can frequently be traced to the other. It would be difficult, if not impossible, to prove from lithological considerations alone that the materials of the Philadelphia gneisses and mica-schists have been derived from the somewhat similar rocks of the Laurentian series, inasmuch as the former have evidently suffered to such an extent from metamorphism as to leave it doubtful whether the rocks as we now see them are in any way like what they were when originally deposited. But in the formation next succeeding the Laurentian, the Cambrian, where in many parts no metamorphic action has retroacted upon the rock structure, distinct evidences of derivation and transference of material are strikingly manifest.

As far as we know no unequivocal traces of organic life have ever been discovered in deposits of Laurentian age; that life *did* exist at this early period, however, there can be no reasonable doubt, seeing how abundant are the animal forms that suddenly appear in the Cambrian deposits. This conclusion is further sustained by the presence of large deposits of limestone and graphite, both of which probably represent organic structures."

Upon the reorganization of the Wagner Free Institute of Science, in 1885, Professor Heilprin received from it a call to the chair of geology then established, and three years later he also accepted the position of curator of its museum. Under the joint auspices of the Academy of Natural Sciences and the Wagner Institute he organized, in 1886, an expedition to the wilds of Florida — a region concerning which there existed little information scientifically corroborated. Thus was inaugurated the series of explorations connected with Angelo Heilprin's name. The results of the expedition, as laid down in the volume entitled *Explorations on the West Coast of Florida and in the Okeechobee Wilderness*, were the determination, based on palæontological evidence, for the first time in the United States, of the existence of a marine Pliocene formation and the description of the characteristic fossils. Professor Heilprin termed the formation the Floridian Stage of the Pliocene, a designation which has been permanently retained in the nomenclature of American geology. In his introduction to the volume Dr. Joseph Leidy said, "the well-observed facts of the report must greatly modify the opinions which have generally been held in regard to the geological construction of the Peninsula of Florida, and altogether Professor Heilprin's researches must be considered as an important contribution to science."

In 1887 Heilprin published *The Geographical and Geological Distribution of Animals*, a work which, as one of the International Scientific Series, took its place as a standard treatise on the subject, both in this country and in England. It is the product of stupendous erudition, and has been linked with Alfred Russel Wallace's similar work (*The Geographical Distribution of Animals*).

In the following year appeared *The Geological Evidences of Evolution*, a lucid summary of the collective geological and palæontological evidences in support of organic transmutation, based on an evening discourse at the Philadelphia Academy of Natural Sciences.

The Animal Life of Our Sea-Shore, also published in 1887, is a popular hand-book on the local fauna of Philadelphia and the animal life of the New Jersey coast. It has passed through several editions.

In the spring of the same year Professor Heilprin took several members of his classes to the Bermuda Islands, for the purpose of studying the coral reefs and examining the current theories of their formation. He embodied the results of his investigations in a volume published in 1889, entitled "*The Bermuda Islands:* A Contribution to the Physical History and Geology of the Somers Archipelago, with an Examination of the Structure of Coral Reefs." The work was notable for the strong arguments advanced in favor of Darwin's subsidence theory. The chapter on "The Coral Reef Problem" will be found elsewhere in this volume.

In 1890 Professor Heilprin published an exhaustive geological treatise, his *Principles of Geology,* which appeared as the seventh volume of the "Iconographic Encyclopædia." In this volume the author elucidated his subject by means of photographic half-tone reproductions taken directly from nature — a form of illustration then still in its infancy. Addressing himself in this work mainly to the general reader, he hoped, by life-like representations, to elicit "a primary interest in the subject that is rarely developed by a diagram or even by a diagram and accompanying text." As in all his works intended for popular use, Professor Heilprin was quick to seize the latest aids in attracting the attention of the reader.

Explorations in Mexico

An expedition to Mexico, undertaken in the same year, yielded important results. Professor Heilprin explored the caves and ruins of the Peninsula of Yucatan, securing valuable collections, and ascended the peaks of Orizaba, Popocatepetl, Nevado de Toluca and Ixtaccihuatl, determining the altitudes of all. He also cleared up hitherto obscure points concerning the geology of Yucatan and the coral reefs of the western part of the Gulf of Mexico, and studied the geology of the great central plateau of the mainland. These observations are embodied in the *Proceedings* of the Academy. It was Professor Heilprin's intention to speak of these and other results of this visit to Mexico and of a subsequent one undertaken in 1906, in a volume addressed to general readers, but, although considerable

material for such a book was found among his papers, the work had not progressed sufficiently for publication. A few extracts from his notes will, however, be found of interest:

Termite Nests

"We first came upon these singular habitations in the open scrub of northern Yucatan, where they were found perched among the axils of low trees, some eight or ten feet above the ground. Their gray color and 'papery' appearance, so suggestive of the nests of the social Hymenoptera, threw out that caution which is ordinarily exercised in approaching the habitations of bees and wasps, but which in this instance was wholly unnecessary. The puncture of the walls disclosed a busy community of almost infinite life — restless and seemingly ever active. In the great mangrove forest which occupies much of the northern coast, the termite nests find their greatest development, and by their singular presence construct a picture hardly to be matched elsewhere. Like great excrescences of the trees themselves, chocolate brown or almost black in color, they occupy positions forty, fifty or even sixty feet above the eye of the spectator. Individual trees may have as many as three or four of these giant nests resting in their axils, while others occupy low positions on the strangled trunks and cable-roots of the foresters, overlooking the oceanic waters which here and there find their way into the solitude. The greater number of the habitations were irregularly balloon-shaped, and some of them measured not less than four or five feet, or even more, in greatest diameter. On all the tree-trunks thus adorned, long and more or less tortuous tunnels, constructed of the same salivary paper, and measuring perhaps two-thirds of an inch across, could be followed by the eye meandering upward to their terminations in the great nests, to which they form the avenue of approach. Wherever tapped they disclosed the same busy life — an army of travelling ants — as did the interior of the nest itself."

An Ascent of Orizaba

"At noon we had reached an elevation of about 16,000 feet. We had for some time before left the sand for a ridge of lava boulders, over which we had hoped to materially lessen the labor of climbing. The snow-field now descended far below us on one side, but along our course we met with only stray cakes or patches of snow and with the layer of ice which remained permanently buried beneath a capping of volcanic debris. I took barometric observations at intervals of about every half hour, and found that we were making 300–400 feet per hour. At this rate we were still removed several hours from the summit.

We found the last traces of terrestrial animal life at about 15,000 feet, where we picked up a solitary lizard from one of the sun-warmed boulders. There were no insects — at least we failed to find any traces of their existence at this altitude. But birds were still observed and heard above us; we thought we recognized the tit and the chickadee, and possibly a species of wren. There was no question as to the raven, whose 'caw' was heard far o'ertop of us, or the sparrow-hawk. At about one o'clock we reached the ice-cap (elevation of 15,500 feet), which is here split by a ridge of rock and boulders entering far into its limits.

It is difficult to describe the sensations of this high-mountain climbing. In its physical expression it may be said to be a continuous alternation between muscular ability and muscular inability. Mentally it was a constant contest between 'shall I go farther, or shall I desist?' With the great and increasing strain that was put upon us, we yet felt normal the moment we sat down to rest; we caught new breath and everything seemed well. We were thus never in a position to definitely know our own condition, since we were constantly fluctuating between 'ups' and 'downs.' But it was patent that after every rest our ability to do work was getting less and less, and the periods of rest were following one another in a disagreeably rapid succession. Our chances for success were becoming steadily less, and we had only just entered upon the snow-field.

Up till now we had not passed over any dangerous places:

there were no steep precipices to climb, nor broad crevices to cross. It would have been all smooth sailing but for the fatigue attending muscular exercise. But now on the snow-field extra caution would be required, and we had but little of that mental strength left which was necessary to properly guide our actions. The snow-field, or more correctly ice-field, was of inconsiderable development, at no point where seen by us attaining a greater thickness than about 5–7 feet. Its surface was everywhere cut up into sharp pinnacles (séracs), two or three feet in height, which, while offering safe lodgment to the feet, rendered progress exceedingly irksome. There was no soft snow, and the feet made but little impression on the crusty surface of the ice. I found the rubbers with which I had provided myself exceedingly useful, but for downhill work they were not as serviceable as the cotton swaths which the guides had fastened around their sandaled feet; they were soon worn through by the sharp edges of the ice, and before my return to the camp that evening there was little left of the soles. Still, for a single ascent they can be used with advantage, and they are in one respect preferable to the native foot swaths — they are less clumsy."

In crossing the Porfirio Diaz Glacier Professor Heilprin and his guide came very near losing their lives. They slipped and were violently thrown on their backs. He writes:

"The full realization of what in apparent certainty awaited us impelled to every effort to break our swift glissade. We thrust our poles as best we could into the crusted ice, bore down with both heels and elbows, but apparently to no purpose. The steep slope of the glacier and the swift journey prevented us from turning on our sides, and on our backs we were helpless. Below us yawned the great chasm which we were trying to circumvent, and to it we were being carried with what might elsewhere have been considered refreshing velocity. No escape seemed possible. A few thoughts of home crowded into my mind, but there was no historical review of the incidents of a lifetime, such as Admiral Beaufort mentions as processioning in the vision of a rapidly drowning man. Down we swept over the first hundred feet, and then over the second, crossing the

steps which we had so laboriously cut on our upward I drew a heavy breath as we neared the impending ice, for in the next instant I expected to see ourselves over its face into the dreary chasm below. But it was e. There was, indeed, little between us and eternity, sufficient to permit us to pull our quivering frames to- nd catch one more leaf of life."

ding, presumably a cushion of softer ice, stopped their s on the very brink of the precipice.

III

ARCTIC EXPLORATIONS

From the year 1891 dates the beginning of those intimate relations between Angelo Heilprin and Robert E. Peary which so largely influenced the career of that great explorer. No one has been more emphatic in acknowledging his indebtedness, in the early stages of his undertakings, to the support of Angelo Heilprin than Peary himself. From the very first day when Lieutenant Peary presented himself at the Academy of Natural Sciences, Heilprin was greatly impressed with his bearing and his evident ability, and he determined to further in every possible way Peary's projects, of whose entire feasibility he never entertained any doubt. "The Philadelphia Academy," says Peary in his work *Northward over the Great Ice,* "was the first institution to which my project was presented, and the first to endorse and commend it, which it did in warm and unequivocal terms. As an institution, however, the Academy never appropriated or contributed a dollar to the Expedition. Members of the Academy, in their private capacity, did contribute powerfully, both in work and money, towards its success. To the personal interest, friendship, and intense energy and push of Professor Angelo Heilprin, Curator of the Academy, was I indebted, more than to any other one person, not only for the official action of the Academy, but for the unofficial interest and efforts of its members, which assured the balance of the funds necessary to make the affair a success."

Professor Heilprin accompanied Lieutenant Peary's North Greenland expedition, which sailed from Brooklyn, June 6, 1891, in the steamer *Kite.* Mr. Heilprin was in command of the West Greenland expedition, which had set out to do its own distinctive work. Associated with him were Professor

Benjamin Sharp, zoölogist in charge; Proefssor J. F. Holt, zoölogist; Dr. William E. Hughes, ornithologist; Mr. Levi W. Mengel, entomologist; Dr. William H. Burk, botanist; Mr. Alexander C. Kenealy, a reporter for the New York *Herald;* Dr. Robert N. Keely, jr., surgeon; and Mr. Frazer Ashhurst.

In the following year Professor Heilprin led the Peary Relief Expedition to Greenland. With him were Henry G. Bryant, the successful explorer of the Grand Falls of Labrador, second in command; Dr. Jackson M. Mills, surgeon; William E. Meehan, botanist; Charles E. Hite, zoölogical preparator; Samuel J. Entrikin; Frank W. Stokes, artist; and Albert White Vorse. The *Kite* was again chartered as the vessel of the expedition.

The story of the meeting with Peary on the ice cap, one of the most dramatic chapters in the history of Polar exploration, is thus told by Professor Heilprin in his volume on *The Arctic Problem and Narrative of the Peary Relief Expedition,* published in 1893:

"On the day following our arrival at the head of the bay, a reconnaissance of the inland ice, with a view to locating signal posts to the returning explorers, was made by the members of the expedition. A tedious half-hour's march over boggy and bouldery talus brought us to the base of the cliffs, at an elevation of three hundred and fifty to four hundred feet, where the true ascent was to begin. The line of march is up a precipitous water-channel, everywhere encompassed by boulders, on which, despite its steepness, progress is rapid. The virtual crest is reached about six hundred and fifty feet higher, and then the gradual uprise of the stream-valley begins. Endless rocks, rounded and angular — the accumulation of former ground and lateral moraines — spread out as a vast wilderness, rising to the ice-cap in superimposed benches or terraces. At an elevation slightly exceeding eighteen hundred feet we reached the first tongue of the ice. Rounding a few outlying 'nunataks' — uncovered hills of rock and boulders — we bear east of northeast, heading as nearly as possible in the direction from which, so far as the lay of the land would permit us to determine, the return would most likely be made. The ice-cap swells

up higher and higher in gentle rolls ahead of us, and with every advance to a colder zone it would seem that the walking, or rather wading, becomes more and more difficult. One by one we plunge through the yielding mass, gasping for breath, and frequently only with difficulty extricating ourselves. The hard crust of winter had completely disappeared, and not even the comparatively cool sun of midnight was sufficient to bring about a degree of compactness adequate to sustain the weight of the human body. At times almost every step buried the members of the party up to the knee or waist, and occasionally even a plunge to the armpits was indulged in by the less fortunate, to whom perhaps a superfluity of avoirdupois was now for the first time brought home as a lesson of regret. We have attained an elevation of 2,200 feet; at 4 P. M. the barometer registers 2,800 feet. The landscape of McCormick Bay has faded entirely out of sight; ahead of us is the grand and melancholy snow waste of the interior of Greenland. No grander representation of nature's quiet mood could be had than this picture of the endless sea of ice — a picture of lonely desolation not matched in any other part of the earth's surface. A series of gentle rises carries the eye far into the interior, until in the dim distance, possibly three-quarters of a mile or a full mile above sea-level, it no longer distinguishes between the chalky sky and the gray-white mantle which locks in with it. No lofty mountain-peak rises out of the general surface, and but few deep valleys or gorges bight into it; but roll follows roll in gentle sequence, and in such a way as to annihilate all conceptions of space and distance. This is the aspect of the great 'ice-blink.' It is not the picture of a wild and tempestuous nature, forbidding in all its details, but of a peaceful and long-continued slumber.

At 5.45 P. M., when we took a first luncheon, the thermometer registered 42° F.; the atmosphere was quiet and clear as a bell, although below us, westward to the islands guarding the entrance to Murchison Sound, and eastward to a blue corner of Inglefield Gulf, the landscape was deeply veiled in mist. Shortly after nine o'clock we had reached an elevation of 3,300 feet, and there, at a distance of about eight miles from the border of the ice-cap, we planted our first staff — a lash of

two poles, rising about twelve feet and surmounted by cross-pieces and a red handkerchief. One of the cross-pieces read as follows: "To head of McCormick Bay — Kite in port — August 5, 1892."

A position for a second staff was selected on an ice-dome about two and a half miles from the present one, probably a few hundred feet higher, and commanding a seemingly uninterrupted view to all points of the compass. Solicitous over the condition of the feet of some of my associates, I ordered a division of the party, with a view of sparing unnecessary fatigue and the discomfort which further precipitation into soft snow entailed. Mr. Bryant, in command of an advanced section, was entrusted with the placing of the second staff, while the remaining members of the party were to effect a slow retreat, and await on dry ground the return of the entire expedition. Scarcely had the separation been arranged before a shout burst upon the approaching midnight hour which made everybody's heart throb to its fullest. Far off to the northeastward, over precisely the spot that had been selected for the placing of the second staff, Entrikin's clear vision had detected a black speck that was foreign to the Greenland ice. There was no need to conjecture what it meant: 'It is a man; it is moving,' broke out almost simultaneously from several lips, and it was immediately realized that the explorers of whom we were in quest were returning victoriously homeward. An instant later a second speck joined the first, and then a long black object, easily resolved by my field-glass into a sledge with dogs in harness, completed the strange vision of life upon the Greenland ice. Cheers and hurrahs followed in rapid succession — the first that had ever been given in a solitude whose silence, before that memorable summer, had never been broken by the voice of man.

The distance was as yet too great for the sound to be conveyed to the approaching wanderers, but the relief party had already been detected, and their friends hastened to extend to them a hearty welcome. Like a veritable giant, clad in a suit of deer and dog-skin, and gracefully poised on Canadian snow-shoes, the conqueror from the far north plunged down the mountain-slope. Behind him followed his faithful companion,

young Astrup, barely more than a lad, yet a tower of strength and endurance; he was true to the traditions of his race and of his earlier conquests in the use of the Norwegian snow-skate or 'ski.' With him were the five surviving Eskimo dogs, seemingly as healthy and powerful as on the day of their departure.

In less than an hour after Lieutenant Peary was first sighted, and still before the passage of the midnight hour of that memorable August 5th, culminated that incident on the inland ice which was the event of a lifetime. Words cannot describe the sensations of the moment which bore the joy of the first salutation. Mr. Peary extended a warm welcome to each member of my party, and received in return hearty congratulations upon the successful termination of his journey. Neither of the travellers looked the worse for their three months' toil in the interior, and both, with characteristic modesty, disclaimed having overcome more than ordinary hardships. Fatigue seemed to be entirely out of the question, and both Mr. Peary and Mr. Astrup bore the appearance of being as fresh and vigorous as though they had but just entered upon their great journey.

After a brief recital of personal experiences, and the interchange of American and Greenland news, the members of the combined expedition turned seaward, and thus terminated a most dramatic incident. A more direct meeting than this one on the bleak wilderness of Greenland's ice-cap could not have been had, even with all the possibilities of prearrangement."

IV

A JOURNEY TO ALASKA

In 1896 Professor Heilprin attended the Mining and Geological Congress at Budapest, as delegate of the Academy, and thence made a journey to the Atlas Mountains of Algeria and Morocco. As a result of his geological investigations, he established the fact of the non-existence of any trace of glacial phenomena in these regions. In the same year appeared his text-book on *The Earth and its Story,* which attained wide popularity in high-schools and colleges.

He next turned his attention to Alaska, which he visited in the summer of 1898, embodying his experiences in a volume entitled "*Alaska and the Klondike:* A Journey to the New Eldorado, with Hints to the Traveller and Observations on the Physical History and Geology of the Gold Regions, the Condition of and Methods of Working the Klondike Placers, and the Laws Governing and Regulating Mining in the Northwest Territory of Canada." While thus mainly intended as a practical hand-book, the volume possesses considerable scientific interest. The chapter on "Physical History and Geology" contains the following striking observations:

"Through virtually the entire Klondike tract and far beyond it on all sides there are evidences of high water flows. No more perfect presentation of high-level terraces can be had than that which defines the first line of heights, of perhaps one hundred and fifty to two hundred feet, which so beautifully impress the landscape of the Yukon about Dawson. The observer, from a still loftier elevation, notes these flat-topped banks, having the regularity of railroad constructions, following the course of the river as far as the eye can reach, here perhaps interrupted by a too steeply washed buttress, elsewhere washed to low level by some stream which has taken a transverse direction. A some-

what higher line of benches curves around the still higher points of eminence, and defines the course of water across country — such, at least, it is to-day. And all the way to the top, scattered evidences of the recent presence of water can still be found. I met with rolled or water-worn pebbles so near to the top (the actual summit and not the position of the signal flag) of the high peak overlooking Dawson that it may safely be assumed that they also occur on the very apex (about eleven hundred feet above the present level of the Yukon), a conclusion which is more than strengthened by the finding of pebbles at even a greater elevation on the French-Adams Creek knob. While thus presenting the evidence of high water levels, I am far from convinced that this evidence points exclusively to river flows. Much more does it appear that, in one part of its history at least, we are dealing with the evidences of the past existence of large lakelike bodies of water, perhaps even of a vast inland sea. The contours of the country in a sort of ill-defined way suggest this interpretation — an interpretation that is not, however, without evidence to support it, and which seems also to have been entertained before me by McConnell and by Israel Russell. The latter investigator has, indeed, given the name of Lake Yukon to a former extensive body of water, of which the existing Lakes Lebarge, Marsh, Tagish, and Bennett, with the connecting Yukon, are only dissociated parts. This lake is assumed to have been about one hundred and fifty miles in length, with a surface elevated between twenty-five hundred and twenty-seven hundred feet above the sea.

Contours of the Country

First in the line of evidence may perhaps be taken the universality of wash gravel and of terrace *débris* and the great heights which they occupy. While I have not myself observed such evidences of water action on the very summit of the Dome, there is reason to believe that they do or at least did exist. Most of this summit, in its narrowed form and rapidly descending slopes, has been, if one may use the expression, more than washed off, and could hardly be expected to retain for any great length of time accumulations of loose fragmental material. But at least its far-off continuation near the source (right

fork) of Eldorado Creek bears some of it on its shoulder, and I have also seen it in an excavation on the loftily located Claim 71 of that stream. Nearly abreast of the international boundary, the one hundred and forty-first meridian of west longitude (Greenwich), McConnell and Russell noted the terrace line of the Yukon River as high up as seven hundred and thirty feet, which is still about four hundred feet below the point where I obtained wash gravel on the peak back of Dawson; but Dr. George Dawson found the terraces on Dease Lake to rise to thirty-six hundred and sixty feet, and elsewhere he calls attention to having come across water-rolled gravel at an elevation of forty-three hundred feet, which would probably exceed by about six hundred feet the culminating point of Dome Mountain. Such high water could, with the existing configuration of the land surface, hardly define any other feature than that of a large interior sea or of a series of lake basins; and while it may be argued that there has been sufficient degradation of the land surface since the period of the height of water to permit us to reconstruct a contour that would be in harmony with altered and reduced river courses, and relieve us from the necessity of invoking the assistance of lacustrine bodies in a solution of the problem, it does not seem to me likely that this has been the case. The physiognomy of the upper Yukon valley supports this contention, and even to-day the river has not yet fully escaped from a lacustrine condition which is merely fragmental of a previous state.

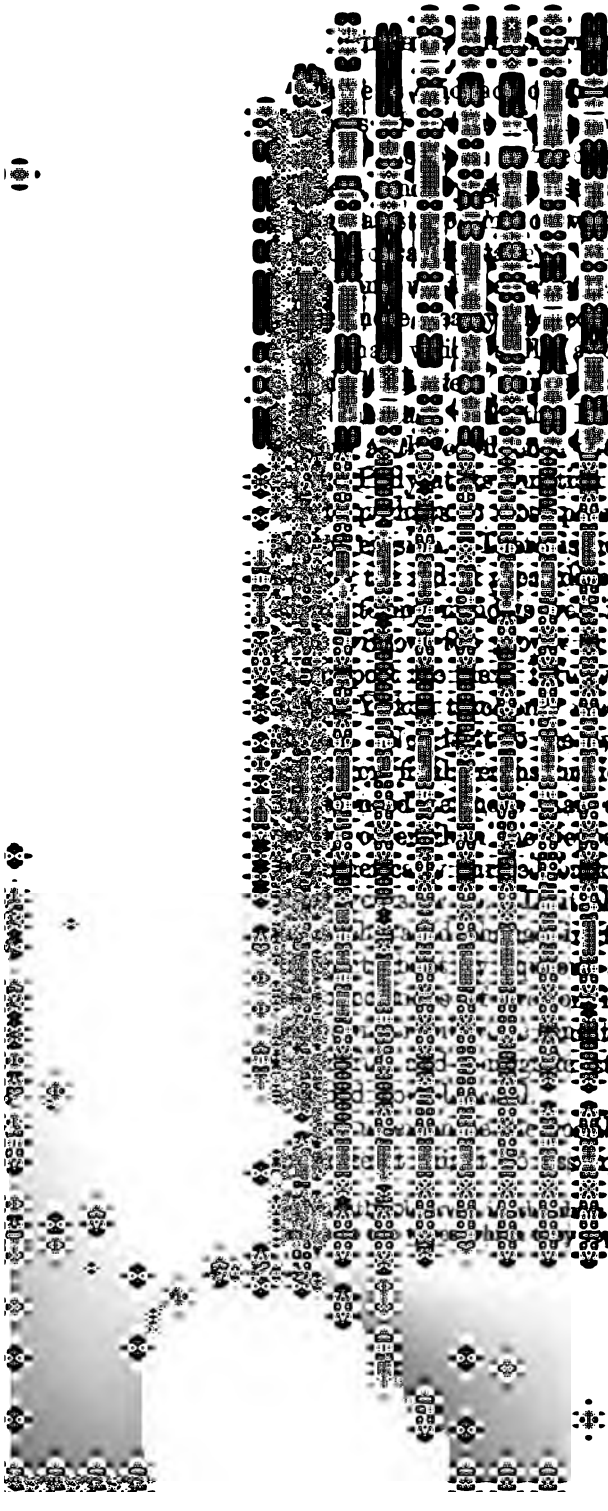
Deposits of Volcanic Ash

On one point bearing upon the succession of events in the upper Yukon valley, and which has its connection with the history of the Klondike region, my conclusions differ somewhat from those that have been expressed by Dawson. This pertains to the deposit of volcanic ash which is so marked a feature of the accumulations of the river's banks. For nearly three hundred miles by the course of the river a stratum of pumiceous ash, ordinarily not more than four or six inches in thickness, constitutes almost without break the top layer but one of the banks on either side, and that which is above it is generally only the insignificant soil or subsoil which immediately supports the

vegetation. So persistent is this ash layer, and so uniformly does it hold to an even thickness and to its exact position beneath the surface, that without further examination one would be tempted to believe from a little distance that it was merely the ordinary subsoil layer from which the color had been leached out by vegetable growths. Here and there, where there have been local disturbances or water washings have produced concentration, it may have acquired a development of a few feet, and occasionally it has accommodated itself to flexures or saggings of the deposits which it normally caps as a horizontal zone. Dr. Dawson, in commenting upon its occurrence, correctly assumes that it represents one continuous volcanic eruption, the date of which might fall well within a period of a few hundred years, and he speculates as to its being possibly associated with an outbreak from Mount Wrangell or some active cone which is represented by the Indians to exist in the region of the upper White River. Beyond this, from the normality of its position, and the assumed fact that no fluviatile or aqueous deposits have been found overlying it, the same observer argues that the outbreak must have taken place subsequent to the formation of the present river courses and their valleys, a conclusion in which I do not see my way to concur. The only satisfactory interpretation of this vast uniformly placed and uniformly layered deposit of ash is to me that which assumes a deposition in a widely extended lake basin, or in shallow lagoon waters which already in part occupied the present valley surfaces. In such waters precipitation from long-continued suspension would proceed gradually and evenly, to the end of shaping a deposit of nearly uniform development and of vast extent. Such depositions we find in the valleys lying north of the City of Mexico (Zumpango, Tequixquiac) and in the lacustrine area of Anahuac, also in the famous fossiliferous basin of Florissant, in Colorado. With the subsequent formation or reformation of the river's course we should have this deposit cut through, with the result of presenting the even layer which is so persistent in its following. This method would also account for the anomalous position in which we find the ash deposits; while still holding the same relation to the top surface, it occasionally rises far above what might be as-

sumed to be its normal height or level above the water's surface — from four to ten feet — a condition that would hardly be in consonance with the assumption that the ash was deposited after the actual river channels had been cut. But other and more direct proof of aqueous occupation after the laying of the ash is had in the fact that in one place at least, and doubtless many more such will be found on closer investigation, lacustrine or fluviatile shells (subfossils) occur in the layer overlying the ash. A locality of this kind is found on the right bank not many miles above the Five Finger Rapids. Here, at a height of not more than four feet above the river, I had the pleasure of determining species of *Limnea* and *Physa*, associated singularly enough with *Helix*, in the layers immediately above and below the ash bed, and in both horizons the species were identical. This isolated fact speaks volumes for itself. Had this been the region of Helena, Ark., I should have been prompted to class the bed with a portion of the Mississippi loess. What interested me further in this connection was the fact that up to this time I had failed to bring to light one solitary mollusc from the upper Yukon, and to all inquiries regarding the existence of shellfish in this northern water invariably a negative reply was received. Only on that day did I again obtain success in my malacological effort, the almost icy waters rewarding my search with a single specimen — unfortunately subsequently lost — of a *Bythinella*, or some closely related type, so that even to-day my knowledge does not permit me to state if the subfossil species of the banks have their living representatives, either specific or generic, in the almost wholly noncalcareous waters of the existing river. The question from more points than one is interesting, and deserves more than passing attention. It may be remarked in this place that the only other fluviatile invertebrate which I found in these waters was a white siliceous coating sponge, whose statoblasts were well visible to the naked eye. Unfortunately, the loss of my specimens has prevented determination, a circumstance the more to be deplored as these fresh-water sponges are the most northern in habit known to the zoölogists.[1]

[1] Professor Russell, in discussing the flood-plain deposits of the Yukon about the mouth of the Porcupine River, says that "fresh-water shells were



...ics of the Yukon Tract

...kind pointing to a comparative ...nt course of the Yukon. The ... by nongeographers and geog... well, that the arm which carries ... does not everywhere occupy the ... as Dawson has well pointed out, ... valley of the Big Salmon appears ...ation of the main valley below ... properly) continues to be desig... ve; and this is still more mark... Inqua (Teslin-too or Newberry ... the Thirty Mile. Even the valley ... with the Yukon, near Fort Selkirk, ... suggest itself as the main chan... ardship to geological facts in in... ements to account for a condition ... pressed upon the landscape; for, ... lly satisfactory evidence in hand ... lieve that the greater part of the ... ly emerged from a lacustrine con... ay means certain that this emer... of the land surface into valley ... w hundred years old, or neces... on of the volcanic ash, which is ... Dawson to a possible five hun... ld be objected that we know of ... configuration of a land surface ...ncies, it might be answered that ... pre-eminently drift-covered re... s and with the influence of a most ...um near by, have neither been

...ties of the case. As an initiatory ... without much chance of either

...sita." Unfortunately, no statement is ...equent.

affirmation or denial, that the degradation of the land surface in the immediate valleys of the main streams is or has been in the past taking place at the rate of half a line per day; so far as the eye and ordinary instruments of measurement are concerned this is a quite inappreciable amount, and I see no reason why it may not be assumed as the working power of the Yukon. With this rate of erosion a valley trough or contour of about a foot and a third might be formed in the period of a single year, or of nearly seven hundred feet in five hundred years, and if we lessen the daily erosion to one quarter of the amount stated — i. e., to an eighth of a line — we should still have in this same period of five hundred years, speaking broadly, a trough of about one hundred and seventy-five feet depth, quite sufficient to have brought about most marked changes in the aspect of a drift-covered lagoon region, and perhaps ample to account for those physiognomic peculiarities which have been discovered. I am fully impressed with the magnitude of the distance which separates the amount of erosion which I have assumed — an eighth of a line daily — from the "one foot in six thousand years," which has been preached categorically from lectern and text-book for the better part of a quarter of a century and threatens to make dogma for still another period of equal length; but the conditions here are entirely different from those of average continental denudation — in fact, have as nearly nothing in common as they can have. My observations in the tropics and subtropics have most impressively taught me the lesson of rapid changes, and with the conditions that are and have been associated with the Yukon, I am prepared for the lesson of equal change in the north. But, as a matter of fact, are we not taught of a removal in the west central United States of some twelve thousand feet of rock strata in a period not impossibly considerably less than two hundred thousand years? The one foot in sixteen years has here likewise nothing in common with the 'prevailing' rate of continental destruction.

While stalled on a bar on the Yukon River, about two miles above Fort Selkirk, I was much impressed with the mechanical work of the stream. The gravel and pebbles were being hurried along rapidly under the lash of a five to six mile current,

and their groans were audible frequently when they themselves were invisible. Every few minutes our steamer would swerve from her seemingly fixed position by the undercutting of the bar, and perhaps it would be not far from the truth in saying that we should be to-day in very nearly the same position that we were in then had it not been for this undermining action of the stream. Let it be remembered that the Yukon has a current ranging up to seven miles, or to eight, as some of the navigators say, and that in certain months it is swiftly ice-bound, both on top and at the bottom, and heavily charged with boulders, and one may well realize the work of which it is capable. That with which I have debited it is purely hypothetical or conjectural, but it may serve a purpose in the elucidation of the main problem."

V

THE DARING ASCENT OF MONT PELÉE

The catastrophes of Martinique, in 1902, were to give Angelo Heilprin world-wide celebrity as an intrepid observer of the death-dealing phenomena on the spot. He left for the island two weeks after the cataclysm of May 8, and ascended Mont Pelée on June 1. His own account of the undertaking, as described in his volume on *Mont Pelée and the Tragedy of Martinique,* gives but a hint of the dangers he encountered:

"We left our animals in charge of one of the Martinique boys at an elevation of about two thousand two hundred feet, and slowly pushed on to the summit. The ascent was an easy one, even if fatiguing at times to the heart and lungs, and presented nothing more difficult than the long slopes of some of our own Appalachian peaks. The course was direct, without zigzags of any kind; and had it not been for the particular conditions which existed at the summit, the 'climb' would have been without color-incident of any kind. As it was, we knew only inferentially what was taking place at the top, and were even in doubt as to whether the summit could be reached at all. Up to this time sky and weather had been most favorable, but the battered volcano had begun to gather to its crown the island's mists, and its own clouds hung ominously over the summit. In a short half-hour the parting-line between the land and sky had been blotted out, and the balance of our ascent was made in cloudland. A discomforting rain fell upon us, and when we finally reached the summit of the mountain, shortly before eleven o'clock, the weather was decidedly nasty. My aneroid indicated an elevation of three thousand nine hundred and seventy-five feet. We were standing on what had been assumed to be the rim of the old crater, on the rim of the basin that contained the Lac des Palmistes. Between shifts in the

clouds we obtained spectral glimpses of the opposing mornes or pitons, their ragged lines rising perhaps two hundred feet higher, and of the flat basin that stretched off to their bases. But of the lake there was nothing. So much of the basin as we could see was absolutely dry, its floor brought up to a nearly uniform level through the fragmental discharges from the volcano. At the point where we reached it there was a clearly marked border rising two to three feet above the floor.

It was evident at a glance that the old 'crater,' contrary to general belief and scientific report, had not been blown out. It remained where picnic parties, seeking its beautiful waters, annually found it to be, where the blue lobelia adorned its banks, and where dwarf palms, succeeding to luxuriant forest, told the land of the tropical sun. To-day not a trace of vegetable growth remained, not even a lichen found attachment on the rough-surfaced rocks that broke out from the scoriated floor. This, at least, was what my observation told me. We sought in vain the position of the vent whence issued the miles of steam and ash that formed the spectacle of the morning, of the evening before, and of every day since the eruption of May 2. It should have been near to us, but where was it? We could clearly hear the rumbling in its interior, the *grondement* of continuing work, but the eye failed to penetrate the sea of clouds that enveloped us, and made our field of search necessarily limited. Ordinarily we could see but a score of yards ahead, and frequently not that far, and in the tempest that swept the mountain we dared not attempt the actual exploration of the summit.

A crash of thunder, that seemed to rend the very heart of the mountain, broke the storm upon us, and silenced all other sounds. In an instant more a second crash, and the lightning cut frenzied zigzags across the blackened cloud-world of quivering Pelée. Then a third and a fourth, and the pitons rolled the echoes to one another like artillery fire. There was no need to look at one another — we knew that we were in a storm-world of our own. Whatever was taking place, was being acted immediately about us. It was a strange sensation this, sitting not knowing exactly where and having as an unseen neighbor one of the mightiest destroying engines of the globe.

The rain descended in merciless torrents, and the lightning cut blinding flashes about us. We sat bowed over our instruments, to give them partial covering, but our clothing, so far as protection to ourselves was concerned, might almost as well have been in the sea. We hoped for a change, but there was none. Our boys were unhappy and trembling in fear of the volcano, and silent tears appealed for a descent. They knew as well as we did that there could be but a short interval between us and the fiery caldron, and they knew, perhaps better than we did, that some of the detonations which we had preferably referred to thunder were in reality the warning notes of the volcano. Leadbeater and I were not yet ready for the descent. That for which we had climbed the mountain had eluded us, and yet could hardly be more than a stone's throw away. We knew not precisely the condition, and dared not search; but we thought that a favoring gust might lift the clouds, and permit us to see ahead. It did not come. My barometer had indicated no gathering storm, no more than did the barometer of Saint Pierre during the eruptions preceding the event of May 8, and indicated no change now. The compass on the crater rim showed, however, a variation of from thirty degrees to forty degrees eastward, the north needle being turned sharply in the direction of Vivé.

Three-quarters of an hour of Pelée's storm was sufficient. It was perhaps the most trying of any like period that I had, up to this time, experienced, and thinking it useless to remain longer on the summit, I decided upon a retreat.

We were both storm-beaten and mind-beaten. A day's effort had yielded little beyond permitting us to say that we had reached the summit of the mountain. The descent was as rapid as the conditions of the atmosphere and mountain would permit, but it was not easy work. The deluge had graven uncomfortable hollows and fissures in the volcano's sides, and running streams of mud and water had taken the place of the hard slope of the early morning. There was no longer a secure foothold anywhere, and it was with difficulty that we kept from sliding into the gorge that lay on both sides of us. By the time we reached our mules, which had been taken to a lower level by the frightened attendant, the storm had partially lifted, and

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never knew it could rain as it did then — with the appalling thunder-charged flashes playing incessantly about me and the very air quivering with the rapidity of the detonations, and but a few feet away the seething, sweltering crater of the most destructive volcano the world has ever seen, will always stand out in my memory as a weird and horrible dream. At last we could bear it no longer, and started to come down the mountain, following our tracks as best we could. While descending the mountain we found that the heavy rains had washed gorges in the mud-covering of the mountain two to three feet deep, and in the blinding rain we frequently stopped on the edge of one of these gullies, which, suddenly giving way, caused us to slip and slide most of the way down. When we got to the end of the "hogback," where we left the mules, they and their keeper had gone. We found them later on farther down the mountain standing in the bright sunshine.

Our day's work, while giving to us many novel and imperishable sensations, had terminated unsuccessfully. We had been repulsed by the volcano, mudded and drenched in a way that severely cautioned us in any further effort not to inquire too closely into nature's hidden secrets. The great caldron of blowing steam and ash had not been reached, or even seen, although we could hardly have been more than a hundred yards from its border. The question still remained, where and how was it? The evening wore off quietly as that of the preceding day, and Pelée once more presented itself in its form of grand and unconquered magnificence. I studied carefully its vast steam-cloud, with its ominous puffs of yellow and brown, and attempted to locate the precise position of its emergence; but what we saw this evening, we had seen the evening before, and also on the evening before that. The lesson still remained to be learned, and I determined upon another ascent for the following day.

Kennan, Jaccaci and Varian, three other investigators of the phenomena of Mont Pelée, had by this time come in from Morne Rouge, and, inspired by the extraordinary workings of the volcano which they had witnessed there and at Vivé, had also determined upon an ascent. We joined forces. As on the day before, the mounts were obtained at Vivé, which also furnished the somewhat larger number of attendants and carriers

who were to do duty for us. We left the latter place shortly after seven-thirty. Our route, except in some narrowing curves, was virtually the same that we had travelled the day before. Once past Morne Balai, we followed the direct course to the eastern arête, up which we somewhat laboriously picked our way. The ascent, owing to the still soft and completely rifted condition of the surface brought about by the heavy rains, was considerably more fatiguing than on the previous day, but reaching the summit was merely 'a pulling away at it,' with plenty of stops to take breath and ease the heart's action. The heat of the open sunlight was, however, very trying, and it was intense on the exposed slope of cinder and ash. There was not even the whisper of a breeze. Mr. Jaccaci succumbed to an early attack of acute dizziness or vertigo, and was obliged to abandon the ascent. When we came up to the old-crater rim, the Lac des Palmistes, shortly before eleven o'clock, the weather and mountain conditions were desperately like those which ushered in the storm of the preceding day. The aged mountain had again buried its head in cloud and vapor, and growling thunder reverberations held out little hope that we should be able to accomplish more than we had already done. Of the distant lowland only parting patches could now be seen, and before long even these were blotted out by mist and rain. On the top it was all cloudland, and with squally rains coming and going in quick turns.

We caught fleeting glimpses of the opposing *mornes* that rimmed in the basin at its farther side, but as yet saw nothing that gave more than a feeble indication as to where might be the line of the working crater. My aneroid reading, without correction for temperature, gave for our position — the same that we had occupied the day before — four thousand and twenty-five feet, which satisfied me that the old level of the mountain had been maintained, and that there had been, contrary to what had been reported, no subsidence as the result of the catastrophic explosion of the 8th. It is true that the piton which bore the cross on the Morne de La Croix had tumbled as the result of a fracture, but this loss to the mountain of perhaps fifty to one hundred feet in no way disturbed the general aspect or mass of the volcano. The shallow trough of the former

Lac is now floored with angular blocks and fragments of ancient volcanic débris, forming part of the former stock of the volcano, and with recently ejected scoriæ, lapilli and mud-ash. These built up the outer face, for three hundred feet or more, of the top portion of the main cone. I took the temperature at several points on the lake-floor and over the rim of the basin and found it to be, at two or three inches below the surface, 124° to 130° F.; at one point, at a greater depth, the mercury rose to 162°. It was evident that this high temperature, about 60° above that of the air, was merely that of the ejected material which had not yet had the time to cool. Puffs of steam and sulphur vapor were issuing from a number of surface vents, and from beneath great boulder masses whose ragged and heated surfaces were scarred with yellow sulphur blotches, and gave evidence of having only recently been hurled to their places from the volcano's mouth.

We waited patiently for a lifting of the clouds, and it came at last. Below the mountain's clouds we could clearly mark out the ascending column of steam, with its flocculent whorls rolling in upon themselves and upward. The position of the crater had been located, but alas! it was for hardly more than an instant. The scene had shifted and disappeared. We were once more in cloudland, waiting and hoping, with our Martinique boys impatient of their assumed trials.

An angry cold wind was now swirling around both sides of the mountain, and with it came a seemingly hopeless rain. All of a sudden a gust cleared the summit, and a white sunlight illumined the near horizon. It seemed hardly more than three hundred feet from us. Across the steaming lake-bed, little mindful of its puffs of vapor and sulphur, we dashed to the line above which welled out the steam-cloud of the volcano, and almost in an instant stood upon the rim of the giant rift in whose interior the world was being made in miniature. We had reached our point. We were four feet, perhaps less, from a point whence a plummet could be dropped into the seething furnace, witnessing a scene of terrorizing grandeur which can be conceived only by the very few who have observed similar scenes elsewhere. Momentary flashes of light permitted us to see far into the tempest-tossed caldron, but at no time was the

floor visible, for over it rolled the vapors that rose out to mountain heights. With almost lightning speed they were shot out into space, to be lost almost as soon as they had appeared. Facing us, at a distance of seemingly not more than two hundred and fifty feet, danced the walls of what appeared to be the opposing face of the crater, and somewhat nearer the ragged white rocks, burnt-out cinder masses, whose brilliant incandescence flashed out like beacon-lights some days after the fatal 8th, and even at our later day illumined the night-crown of the volcano with a glow of fire. We could not tell at the time if they were part of a cinder-cone, or merely an accumulated heap that had been piled upon itself. The spectacle was a stupendous one, — like a wild tempest raging everywhere. We stood silent, overawed in its presence. The ground trembled at times, but never with any degree of force. We felt no inconvenience from either gas or steam. A low rumbling detonation, broken at intervals by louder bursts, crept about the hidden floor of the interior, from which also issued the sounds of clinking, falling and sliding cinders, the hissing of the emerging steam — sounds which one would fain describe were it possible to do so. I tried so far as it was possible to localize the issuing sounds, but the 'blanketing' by the enormous masses of swirling steam prevented this; everything seemed to come from everywhere, with no marked accentuation in any particular quarter. Occasional gusts of wind cleared the foreground, and displayed the giant smoke-column in grand magnificence.

Our Martinique boys appeared to be as much impressed by the scene as we ourselves were, and for a time lost all fear of the awakening dragon. We found that we were standing on the edge of a vertical, perhaps even overhanging, cliff, and not feeling disposed to remain longer than was necessary to make notebook observations and take photographic views, left rather precipitately for lower regions.

I felt that finally I had stood over nature's great laboratory, and been permitted to study some of its workings. Many years before on Vesuvius I had gazed into the crater funnel, and watched the molten magma of the earth rise and fall, but the scene was one that could not compare with this, grand and inspiring though it was. I attempted to locate the axis of the vent

is nearly as the direction of the largely-obscured walls and the position of the basin of the Lac des Palmistes permitted, which was north to south, slightly southwest. The magnetic needle, which showed such a marked deflection on the border of the lake-basin, was normal or nearly so. The form of the crater was at this time that of a caldron-rift, pitching steeply downward, and opening in a direction a little off from the line to Saint Pierre. The length could be only roughly approximated, and at no time could we positively ascertain the extreme boundaries. There can be no question that it traversed the position of the narrow rift known as the *Fente,* or the *Terre Fendue,* which had been a feature of the mountain since the eruption of 1851, perhaps considerably preceding that event in its existence.

The fact that, standing on the rim of so active a crater, we were not inconvenienced by any marked excess of temperature seems rather remarkable, and might be thought to find its explanation in the very rapidly ascending masses of steam — the condition of continuous atmospheric displacements which it brought about. But even these were little appreciable where we stood, which was more like a region of almost absolute calm, despite the storm that raged in its centre, than one of flickering disturbance."

Mr. Heilprin's bearing during these trying hours made a deep impression upon his companions. Mr. George Kennan, in his report of the ascent, said: "I must pay the highest possible tribute to Heilprin. He is modest and brave, a superb mountaineer and the nerviest and pluckiest man I ever knew. The ascent was the most terrifying experience of my life." The press throughout the country hailed the achievement as an almost unparalleled display of scientific ardor. In its issue of June 2, the New York *Evening Post* said editorially:

"Newspaper enterprise has to bow to scientific enthusiasm in the matter of the first ascent of still smoking Mt. Pelée. Professor Angelo Heilprin was already known as an intrepid explorer, delighting equally in Sahara and Greenland, and climbing difficult Orizaba, whose height and pre-eminence among Mexican mountains he first correctly determined; but his calm rivaling of the elder Pliny — and surpassing him in

good fortune — by mounting to study, in situ, a volcano in eruption, will make his name famous throughout the world. Of that result, however, we may be sure that he never stopped to think. His preoccupation was entirely that of a scientist, bent on discovery of the truth, even at the hazard of his life. With intelligence to guard against every needless risk, and yet with constancy and professional zeal to make him face cheerfully all inevitable danger, he gave a fine example of the unconscious courage and heroism of the scientific spirit. No doubt he experienced intense exhilaration, amid those showers of boiling mud and red hot cinders, as he went on quietly observing the phenomena which his trained eye could so well interpret."

A Second Visit to Martinique

Even greater were the dangers the fearless investigator encountered during his second visit to Martinique, in August. His account of the destruction of Morne Rouge is as follows:

"Throughout the whole of Friday, August 29, Pelée kept up a continuous growl. The sound came to us like the rumbling of wagons crossing a bridge, and at times like distant thunder. M. Louis des Grottes, our host at the Habitation Leyritz, where we had been installed the evening before, felt uneasy, and thought that many days might elapse before an ascent of the mountain could properly be attempted. On the evening of Monday preceding there had been a wonderful exhibition of volcanic pyrotechnics, and everybody spoke of the great 'flames' that were seen to shoot out from the crater, of the volcanic corona and of scintillant stars; and since then the volcano had been continually in unrest. Refugees were seeking the roads at all points, and the north of the island was once more in the condition that marked the early days of May. The Habitation Leyritz lies on the northeastern foot of Mont Pelée, at an elevation of about five hundred feet above the sea, and I had selected it, on the invitation of M. des Grottes, as a base of operations alternative to Ajoupa-Bouillon or Morne Balai, it being more closely approached to the volcano than either Assier or Vivé. Its position is delightfully in the path of the ocean breezes, and its stately cocoa-palms are only four miles distant, *à vol d'oiseau*, from the

active crater of the volcano. When we arrived there shortly before sunset the hour of rest had already been proclaimed to the workers on the estate, and inquisitive groups of coolies and dark creoles lingered and loitered about, some chanting the evening hymn. The little Martinique blackbirds whistled out their beautiful and mellow notes until late in the evening, and after that, except for the roar of the volcano, the 'silence of night' was left to the minstrelsy of the tree-toads.

We were up some time before the rising sun, and saw the day break fair, with a gentle breeze sweeping over the tops of the nodding cane. A few bad clouds were chasing after the eastern horizon, and others hung over the black peaks of Carbet, but they went the right way for us, and they augured well. The difficulties that attend starting in the tropics delayed our departure until after six o'clock, an hour that seemed early enough for the kind of day that promised. An hour before that time it was still dark. At Morne Balai, which we reached in half an hour, my little party, consisting of Julian Cochrane and myself, with three foot attendants, was joined by seven volunteers, who felt that the spirit of the volcano had been controlled by us, and believed that they could courageously follow in our footsteps. One of these I had well known from my earlier ascents, and he stood as prophet and informant to the others, basing his superiority upon a very fragmentary knowledge of English. Our purpose to study the great cone that had so rapidly built itself up in the heart of the crater was perhaps unknown to the joining party, but they held their courage well throughout the greater part of the day. Alas! poor souls, they little expected that the tongue of the fiery dragon would visit their homes ere night had fairly fallen, and bring sorrow and death to the heart of a peaceful and quiet-loving community. When I last rode through the garden-lanes of Morne Balai everything was deserted — the gardens were empty and the doors of the thatched cottages closed. New ashes had fallen since the day of Saint Pierre, and the inhabitants lacked the courage to remain. Life had now come back to the village, and how beautiful this morning were the copses of banana, of palm and breadfruit, the hedge-rows, and the great blazing blossoms of the hibiscus! A more charming village scene could hardly be found.

Our course up Pelée was from this point the same that I had taken on my previous ascents, over the easy arête that forms the central eastern ray of the volcano, and lies a little northward of the ravine of the Falaise. The conditions of the ascent on this day were surprisingly favorable, and we were able to make use of our animals up to a height of nearly two thousand three hundred feet. A light growth of grass had begun to cover the arid slope of ash and cinder, and the blackened forest of the ravine slopes was also touched on the crown with green. The beautiful tree-ferns, more particularly, gave evidence of this new life, and they promised to restore in a short time to Mont Pelée that verdure for which the mountain had been dear to the Martiniquians. It was evident that the burned forest was not absolutely dead, and its greens were already being picked by troops of blackbirds, fly-catchers, and the *hirondelle-mouche*. Myriads of green and green-and-black caterpillars were cropping the new vegetation. They had found a comfortable home in this newly regenerated upper world, and were making the best of their time. It was evident that the volcano had blown to them a good wind. Such sudden visitations of insects to recovering volcanic regions have been noted before, and have brought many problems to the entomologist which still await solution.

We left our animals shortly after eight o'clock, and at that time the volcano was raging. The steam-cloud roared out of a seething furnace and swept the summit from our view. Back of us dark-blue shadows were checkering the receding landscape, but the ocean was the blue and green of the coral reef, and lovely Morne Rouge was bathed in warm sunshine. Nearer to us Ajoupa-Bouillon, slumbering in sunlight and shadow, lay almost at our feet. We picked our way leisurely up the cinder slope, but it was evident that ejected bombs had recently scarred its surface, for there were furrows and troughs and great boulders where none had been before. We also noted a number of the puzzling crater-like shallow pits or hollows which some have thought to associate with falling rocks, others with earthquake phenomena. In a few minutes more we were in the storm-cloud, with only bits of landscape to follow us as companions. The great knob of Morne Jacob appeared and disappeared, and at intervals we could glance into the deep gorges on either side of

us, but of the summit of the mountain there was nothing. Our Martinique associates were uneasy, for from the invisible gray ahead came the terrific voice of the volcano. There were no accentuated detonations, but a continuous roar that was simply appalling. I thought on my previous ascent to have heard something, but this time it was the old sound multiplied a hundredfold. No words can describe it. Were it possible to unite all the furnaces of the globe into a single one, and to simultaneously let loose their blasts of steam, it does not seem to me that such a sound could be produced. It was not loud in the sense of a peal of thunder, but of fiery and tempestuous storm, that could best be compared with the blowing of the ocean's wind through the shrouds of a full-rigged ship, only ten times that. The mountain fairly quivered under its work, and it was perhaps not wholly discreditable that some of us should have felt anything but comfortable.

Where was all this? we asked ourselves. In front of us, but invisible. My aneroid gave for our elevation three thousand four hundred feet — therefore we were only six hundred feet below the summit-level which marked the position of the Lac des Palmistes. There appeared to be no barometric disturbance, nor was the compass-needle affected. A whistling bomb flew past us at this time, but it left but a comet's train in our ears, for it could not be seen. We took it first for a flying bird, but its course was soon followed by another, and then came the dull thud of its explosion in air. Deep down the ravine we could hear the scattered parts tumbling, sliding and crackling. We could no longer deceive ourselves as to the character of the struggle into which we had entered. The ominous clicks in the air told us what we might at any moment expect.

We moved up slowly, hardly more than a few paces at a time, but with hope given to us in the occasional rifting of the clouds. Time and time again the summit crest appeared beneath the rolling vapors, and it really seemed as if the cone, of which we were in search, would suddenly come to view. When we had reached about three thousand eight hundred feet the fusillade of bombs became overpoweringly strong, and we were obliged to retreat. We were in battle. The clouds had become lighter, and we could at times see the bombs and boulders coursing through

the air in parabolic curves and straight lines, driven and shot out as if from a giant catapult. They whistled past us on both sides, and our position became decidedly uncomfortable; many of the fragments took almost direct paths, and must have been shot into their courses as a result of explosions taking place above the summit of the volcano. They flew by us at close range. Descending perhaps one hundred feet lower on the slope, we took shelter under a somewhat rolling knob and waited for a possible cessation of the fusillade. A glance at my men showed that they were thoroughly frightened, and most of them were making quick tracks to a lower level. A lull favored a further effort. Not wishing to incur any responsibility in a call for company in what appeared to be a rather hazardous enterprise, I made a second attempt by myself, keeping my body as close to the ground as was possible. The clouds soon separated me from my associates, and all of visible nature that was left to me was a patch of slope and the shifting vapors. Mr. Cochrane's figure was the last to disappear. The roar of the volcano was terrific — awful beyond description. It felt as if the very earth were being sawed in two. In about a quarter of an hour I reached a point just below the summit — the crest of the old lake basin — which was being heavily raked by the fire of the volcano. I could see no more than before. Everything was as if in a surging sea, and neither the cone nor what was left of the Morne de La Croix was visible. I crouched down to the ground, but to no purpose. It was useless to remain longer in the open fire, and I descended to join my associates. Mr. Cochrane was near at hand, working his camera and seemingly indifferent to the encircling storm, but the negroes had gone far below, carrying our provisions with them. I was surprised, indeed, that they should have retained their courage for so long a time, for Pelée had been unusually active for a number of days, and if men ever feared anything, it was this grim monster of Martinique. But most of them had remembered my earlier ascents, and they childishly seemed to feel that there was shelter in my wake.

Shortly before noon a sudden lifting of the clouds revealed the volcano in all its majestic fury. For the first time since we reached its slopes were we permitted to see its steam-column — that furious, swirling mass ahead of us, towering miles above

the summit, and sweeping up in curls and festoons of white, yellow and almost black. It boiled with ash. The majestic cauliflower clouds rose on all sides, joining with the central column, and it was evident that the entire crater was working, bottom as well as summit, and with a vigor that it would be useless to attempt to describe. Higher and higher they mount, until the whole is lost in the great leaden umbrella which seemed to overspread the whole earth. I estimated the diameter of the column as it left the crest of the mountain to be not less than fifteen hundred feet, and its rate of ascent from one and a half to two miles a minute, and considerably greater at the initial moment of every new eruption. Great exploding puffs were following one another in rapid succession, and they told the story of what was going on inside the volcano.

Cochrane and I were not the only ones to be inspired by this extraordinary and bewildering spectacle. Our Martinique men seemed equally overcome by a grandeur of nature, terrifying as it was beautiful, which they had not before seen, and of their own accord initiated a new effort to reach the summit. We climbed back to our former position, but the bombardment was too strong for us, and we thought best to desist. The prospects for study were anything but promising, and it was thought unnecessary at this time to take further risks. Of our party of twelve there were now only four left on the upper slopes of the volcano, but we still hoped for one more chance. For a half hour or so we took refuge in a hollow sufficiently deep to about clear our heads, and waited. But even the pleasures of a mountain lunch did not quite make this place restful, for the bursting bombs flew thick to one side, and we were too eager to watch the flying fragments to permit ourselves a free moment. Every scattering mass brought us to our feet, only to see and hear the fragments plunging into the abyss that lay to one side. Cochrane and I moved a piece higher up, and then abandoned the effort. 'Where did this last block burst?' I asked of my associate, and before my question was answered we were spattered with mud from head to foot by a great boulder, hardly smaller than a flour-barrel, which fell within ten feet of us, or less.

When we reached the lower slopes we were covered with ash and mud. For an hour or more we were nearly beneath the

centre of the great ash-cloud, whose murky masses hung at a dizzy height above us. Its mantle-sheet carried darkness to Macouba and Grande Rivière, and far over Dominica and Guadeloupe the black mass still swept out to sea. I believe that the ash-cloud must have been fully six miles above our heads. It rolled out a few peals of thunder, but we observed no flashes of lightning. The ash fell lightly, and coming mixed with water soon consolidated into a paste. It had the temperature of the surrounding air — was not warm. There were no large particles. The coarser material fell miles from us, at positions situated more nearly under the periphery of the cloud.

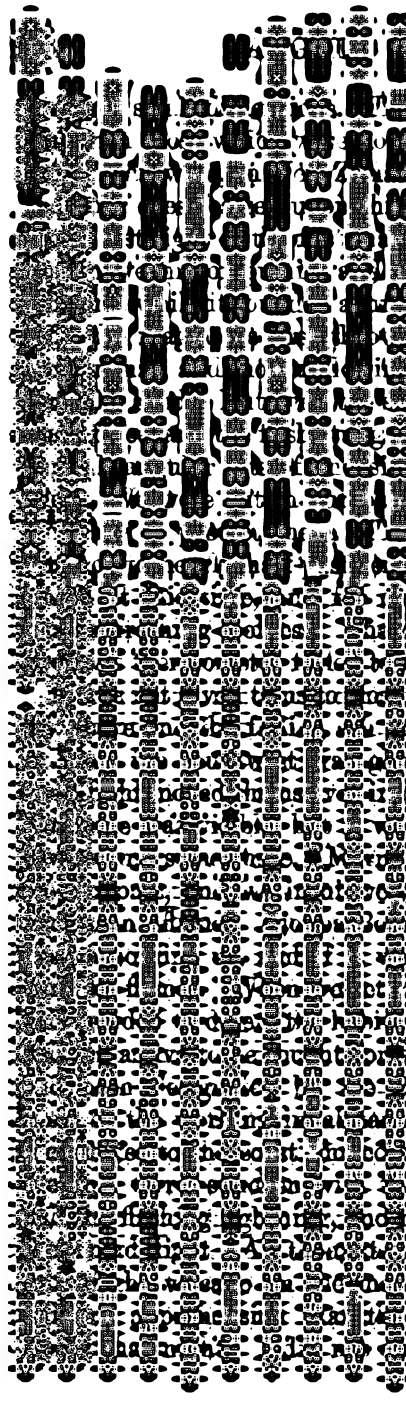
It is singular that even at the point where I was nearest to the issuing steam, a distance of probably less than four hundred feet, no marked atmospheric disturbance was perceptible, nothing to even remotely suggest a cyclonic or suctional whirl. One could readily have expected something of this kind to occur. Nor do I believe that there was any noticeable elevation in the temperature of the air. Unfortunately, the single thermometer that I had with me had broken earlier in the day, and, therefore, my note on this point rests solely on a personal impression. Certainly there was no emphasized change in temperature. I could detect no gaseous emanations, except, perhaps, a very feeble taint of sulphur.

When we again got on the level ground back of the Habitation Leyritz we were startled by a most violent eruption from Pelée, a great shaft of steam and ash being suddenly shot out to a most marvellous height, perhaps not less than five or six miles. It went up as a distinct column of its own, swiftly distancing the other cloud-masses by which it was enveloped. It was a prelude to the incidents of the evening that followed.

We arrived at our shelter a little before five o'clock, somewhat to the relief of the household, who had become apprehensive regarding our safety. Early in the evening the big blaze from an incendiary fire announced the destruction of the *case de bagasse* of the Habitation Pécoul, but it gave us little concern, as our cane-fields were sufficiently removed to insure them from contact with the flames. Still, M. des Grottes thought it advisable to examine the premises, and he rode down with his brother, more, perhaps, as a pastime than as a necessity, re-

turning for a late evening meal. While still seated at the table, a flash of lightning and a dull thud told us in an instant that something was happening. We were out at once. This was a few minutes, perhaps a quarter of an hour, after nine o'clock. The volcano was still distantly growling. The heavens were aglow with fire, electric flashes of blinding intensity traversing the recesses of black and purple clouds, and casting a lurid pallor over the darkness that shrouded the world. Scintillating stars burst forth like crackling fireworks, and serpent lines wound themselves in and out like travelling wave-crests. The spectacle was an extraordinary and terrifying one, and I confess that it left an impression of uncomfortable doubt in our minds as to what would be the issue. One could not but feel that a tremendous destruction was impending.

The number of forms in which the illumination appeared was bewildering, and I can only recall a few, the picture of which presented itself to my eyes with precision: short, straight, rod-like lines, wave-lines, spirals, long-armed stars, and circles with star-arms hanging off from the border like so many tails. In addition to these were the scintillant stars to which reference has already been made, and the blinding flashes of normal or zig-zag lightning. There were no peals of thunder, but a continuous roar swept through the heavens, mounting with crescendos and falling off with alternating, far-reaching diminuendos. Some pretend to have heard a feeble crackling, like that which is so often heard in association with an auroral display, but I am not sure that I could record this condition, which may easily have existed, among my own experiences. The flashes were bewilderingly numerous, and the singular forms interwoven with one another in such a way as to make localization difficult. The scintillant stars alone appeared to have a place of their own, nearer the border of the great cloud, and perhaps in the highest parts of it. Directly over the summit of Pelée there was little to be seen. Who is there to tell us what these peculiar flashes are? Are they electric, or are they the flashes of burning gases? It would, probably, be easy to determine their nature by means of the spectroscope, but this form of examination has not yet been made. It is certain that most of them are not connective discharges, for they run through, or are contained in, individual



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that there might be no one in the morning to open it, but the hours for rest were spent mainly in thinking.

The night-air was almost without breeze, so different from what we had had up till now. I tossed around until about one o'clock, sleeping in snatches, but hardly resting. At this time there was another sharp pattering of cinders, and I moved up to the window, only to see darkness. On another side the sky was flashing bright tongues of light, but I saw nothing of it, and knew not that it was taking place. Before retiring again I had to clear my bed of ashes, for the covers and pillows were being rapidly filled, and a new fall was only just beginning. The poor tree-toads, despite everything, were still chirping, and manifestly to them life was not a burden, nor even a piece of anxiety. I do not know to what extent it is true that before the eruption of May 8 the animals of the field and forest gave signs of uneasiness, and summarily left their homes in search of new quarters. Nothing of this kind appears to have been noted on this side, which is in itself not conclusive evidence denying the condition reported, and I know that on Sunday morning the blackbirds were, as usual, gambolling about the cocoanut crowns, and sending out their joyful notes to greet the rising sun.

Before the morning had yet broken, news reached us that the fiery tongue of Pelée had carried death and desolation to Morne Balai. The flash of nine o'clock, when the heavens were glowing and scintillating with fire, was the lumen that showed the path to the pretty village which we had left hardly five hours before, and from which weeping messengers had now come to ask for aid. I immediately rode out with M. Édouard des Grottes to ascertain the extent of the casualties and what in fact had taken place. We had hardly a mile to go, even with the windings of the path, and were soon conducted to the scene of the disaster. In one of the low thatched cottages two bodies were stretched out stiff in death, and near by others were lying groaning in agony from the terrible burns they had received. Still others, which we did not see, were in the neighboring *cases*. We gave such comfort as reassuring words could offer, but, alas! of what value are they? M. des Grottes arranged for the care and removal of the wounded, and we then left. One of those who had

been with me on the mountain in the afternoon was a victim to the volcano's wrath, and his body lay not far from the hut where we had halted for a few minutes for a friendly chat, and which was now flat with the ground. It had tumbled with the volcano's blast; others like it had fallen under the weight of ash that had been showered upon them.

My parting from Morne Balai was a sad one. It was hard to realize that this pretty little village, which appeared to me so joyful a few hours before, should now be clouded in the shadow of death — death driven to it by the same force whose enigma I was attempting to penetrate. As we looked down upon it from the slopes of Pelée, it lay so peacefully embowered beneath its clumps of verdure, apparently so far from danger's door. Nature had turned her hand and heart, but this was only a part of the history of the night before. Ajoupa-Bouillon, Morne Rouge, Morne Capot, the heights of Bourdon, were wrecked, or had been entirely wiped out, and with them two thousand more of Martinique's inhabitants were sent to their graves. On all these sites we had gazed in the quieter afternoon; we had noted the fleeting cloud-shadows passing over them, and seen the smiling fields and forests that bound them into one vast sea of green. Desolation had swept all this into gray and black. The very slope that we had travelled over was culled in the fiery blast, and wreck and ruin were everywhere. Our own escape was, indeed, a very narrow one, for the blast swept the land to both sides of us, and even descended to the rear of the Habitation. Good fortune much more than management gave to us our place of refuge.

It was only when we reached Vivé that the full extent of the catastrophe was made known to us. The great sugar estate had once more set her wheels moving, and from the lofty chimney curls of smoke were again peacefully flowing over the verdant fields of cane. The Rivière Capot, whose *débordements* had been so much feared and had caused so much damage, was no longer a dangerous stream, and confidence came to all who felt that the worst of Pelée was over. Its work was thought to belong to the south and to the west, and few feared, even in the face of the magnificent pyrotechnic display of later days, that anything serious could happen on this side. Refugees had been

returning by hundreds to their abandoned habitations, and the silence of desolation once more woke to the voice of the living.

In front of the great Usine, when we arrived there this time, crowds of refugees coming from Basse-Pointe, Macouba and Grande-Rivière, and from minor hamlets in the interior, had assembled, and travelling parties were all over the roadways. Afoot and on wagon, everybody was going, with no one having a good word for the country. Improvised ambulances were being sent in to Ajoupa-Bouillon, and since the earlier hours of morning the wounded were being brought out in scores and sent down to Grande-Anse to be placed under government treatment. The good people of the Usine were doing everything that under the circumstances could be done to alleviate the sufferings of those who were still living, but, unfortunately, for many their work came too late, for they died on the roadway. And perhaps it was best that it was so, for death removed from the body an agony that cannot be conceived, while the chance for recovery was all but nil. Less than four months had elapsed since the catastrophe of May 8 overwhelmed Saint Pierre, and the tragedy was being enacted over again.

M. Joseph Clerc kindly invited me to join him in a survey of the situation at Ajoupa-Bouillon, and we rode out almost immediately after my return to Vivé. The village of Ajoupa-Bouillon lies on the eastern foot of Mont Pelée, in a direct line not more than one mile from the more recognized slope of the volcano, and at elevations ranging from about eight hundred to thirteen hundred feet above the sea, some extreme parts rising possibly higher. It is connected on the inner side with Morne Rouge by one of the finest roads in the island, which before the catastrophe of this day was bordered by a woodland of singular beauty. Its houses were mainly of wood, but there were others of a more substantial construction, and nearly all had gardens of their own. A graceful church steeple, still standing, rises up from nearly the highest part of the village. Four days before this second visit I had come out with the acting Mayor of the village, M. Kloss, to look over his large cacao estates, and to join in an excursion to the Trianon, the site of a former hospital camp, situated directly above what had been assumed to be a new crater in the gorge of the Falaise. At that time Ajoupa-

Bouillon looked more attractive than I had ever seen it before. The vegetation was at its best, and seemed to have profited by the ash that had been thrown over it in the early days of May. Not here alone, but all over the north this extreme of 'pushing' fertility was noticeable, and everybody remarked upon the luxuriance of growth which distinguished field as well as forest. To this end, at least, of adding fertility to the soil, the volcano may have contributed, and done something to redeem its bad name. To-day, alas! much of this had gone. In place of field and forest there were desolate plains, gray-scarred, ash-covered, and bleak almost as the African desert. We looked over to the mountain-heights and down into the valleys and gorges, and everywhere the eye fell upon ruin and desolation. Only back of us and in the farther distance was there enough of verdure left to remind us of the past.

The force of the destruction was extraordinary. Before we reached the main scene of the catastrophe the wreck was already fully indicated in a number of houses which were laid flat with the ground, and in overturned trees with buttressed roots lying to the side of the coming blast. Boards were found completely penetrated by others that had been shot through them. It was evident at a glance that it was the history of Saint Pierre over again. The zone of destruction began a short distance above and beyond the church, and extended almost without interruption, so far as we could see from the heights, to Morne Rouge. Looking over to the site of that town, we saw before us nothing but a withered plain, with arid slopes on one side of it, and slightly green mornes on the other. Cattle and horses were lying on their backs, with their legs rigidly extended into mid-air. A few more fortunate beasts, with raw flesh protruding from their tightened hides, were moving aimlessly about, as if dazed by the conditions that now surrounded them. Clear up to the low saddle between the Morne Jacob and the Calebasse the eye followed the bleak landscape, and it was plain to see that the tornadic blast had this time lined its course over this arête, instead of confining itself to the zone of the Rivière Blanche on the opposite side of the mountain. The first houses that we examined had simply collapsed. They occupied their own ground and were merely a mass of sticks and roof material,

covering all that the houses contained — inmates probably as well as their belongings. We put our ears to the ground and to the planking, but could hear no sound. Off on a side-lane we passed a little cottage apparently untouched on the exterior, and hearing deep moaning we entered. A poor woman, of perhaps thirty years, was rolling in agony in one corner of a dark room, her flesh terribly burned and hanging in places from the bone. She called incessantly for water to relieve her excoriated throat, but it could not be furnished. M. Clerc sent immediately for the gendarme, to have her removed where friendly care could be administered to her, but she died shortly after our leaving.

We entered another *case* near by. A dim taper illumined a nearly black interior sufficiently to permit us to see a writhing figure being tended by the hand of one who was left, probably dearest to it. The cries of pain were heart-rending. Flies were swarming everywhere about the place and the odor was almost unbearable, as the precaution had been taken to keep the door closed. A body, relieved from anguish, lay stiff in another corner. We passed from this to another house and saw the same picture repeated. In reply to inquiries put to him by M. Clerc, one of the inmates, perhaps less terribly burned than some others, stated that he had been struck by the hot blast at the moment of opening the door of his *case*, which he had done assuming that the storm had passed. Instantly the fiery air enveloped him, and he felt the sensation of choking. There seemed to be no air to breathe. His flesh was as if baked and steamed, with raw red masses appearing where there was no longer skin. The clothing had remained untouched. I inquired if he had noted gas of any kind. He replied in the negative, except to the extent that a feeble sulphurous odor, already appreciable in the earlier part of the evening, could be detected. We obtained almost exactly the same history from an adjoining cottage. In some cases, perhaps even a large number, where the cottages had the doors and windows firmly closed, and were able to withstand the force of the tornadic ferment, there was little or no injury done. In the greater number of cases, however, it is certain that the fiery breath entered even where every opening avenue had been secured. This was also the case, as I ascertained later, at Morne Rouge.

There was here, as at Saint Pierre, the same reference to the *feu,* or fire, but it was evident that only a heated or a luminous blast was conveyed by this designation, and nothing burning with a flame. It seems certain that in some instances the darkness of the interiors was actually illumined at the time of the entry of the hot blast, and some claim to have seen electric discharges traverse the room. I think this condition exceedingly likely, and have always believed that localized lightning must have played an important part in the destruction of life at Saint Pierre. There was no evidence at Ajoupa-Bouillon of anything having burned with a flame within the village itself nor in the surroundings. One-half or more of the settlement had been scorched or swept out of existence, but there had been no fire of any kind. The sticks and planking of the cottages showed no change to the eyes except that they had become gray, mainly, perhaps, as the result of the splattering with ash. Even the dry palm-thatching had remained intact, with no evidence of true burning of any kind. The trees and bushes that still stood in and out of the village had their leaves, clinging to the twigs and branches, shrivelled up and turned to gray and umber. Nothing had been carbonized, although the sap had been exterminated and the smaller twigs broke fragile. I searched in vain for any indication of active terrestrial gases, and could detect no trace of any gaseous odor, not even that of sulphur.

The destruction of Ajoupa-Bouillon took place almost immediately after nine o'clock of the previous evening. It was also the time of the destruction of Morne Rouge and the invasion of Morne Capot, and there can be no question that all the havoc that had been wrought on this fatal August 30 was the result of one explosive blast, whatever may have been its exact nature, or of a series of such blasts following rapidly upon one another. It is singular that we, who were passing the evening at the absolute foot of the volcano, much closer to it than some points that had been destroyed, and remarking upon the magnificence of the electric display, absolutely above us, should barely, if at all, have noted the detonations which preceded, acompanied, or followed the explosions. At St. Kitts, two hundred and seventy miles northwestward, the booming of the volcano sounded at this time like the cannonading of a naval com-

bat in which the largest guns were being used; and the same observation was made at Port-of-Spain and elsewhere in Trinidad, at a somewhat farther distance in a direct line southward. In Fort-de-France hardly more than the continuous terrific roar of the volcano could be heard, and it was this, together with the illumined ash-cloud, which threw the inhabitants into consternation and initiated the new panic. I confess my inability to satisfactorily explain this singular disposition of the sound-waves, as every explanation that has suggested itself to me seems to meet with some objection. It is not the distance at which the detonations were noted which imposes the difficulty to the problem, but the fact that so transcendent a sound, originated with explosive violence, should hardly have been noted in or near the epicentral region. Is it an extreme condition of sound-shadow? Or has the cavernous and 'blanketed' condition of the volcano something to do with this? Or are we forced to admit a series of paroxysmal deep-seated explosions occurring in the horizontal conduit of the volcano, and immediately antecedent to the vertical discharge? The latter condition, apart from any relation to the present inquiry, is, of course, well possible, and even very likely. The acoustical relations of the May 8 eruption were similar to those of the later day, and it is interesting to note that Alexander von Humboldt, referring to the eruption of the Soufrière of St. Vincent in 1812, remarks upon the same peculiarity of sound-carriage — the eruption being more distinctly audible at a distance from the island than near to it.

The conditions of time did not permit me to visit Morne Rouge, and my only glimpse of the destroyed city was obtained in sailing out from the island. The sole structure visible was the stately church and its sharp steeple, always so prominent as seen from the site of the northern Saint Pierre. A part of the roof had been lifted, but this could not be seen — nor the other remaining houses which told of the former existence of a city whose population ranged from three thousand to four thousand or more. Like its sister city, Saint Pierre, to whose wealthier inhabitants it ministered the cool of mountain breezes and the solace of verdant fields and forests, Morne Rouge was wiped out — razed to the ground and in part burned

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following morning, still fully conscious and expressing anxiety for his flock. He was removed to Fonds-Saint-Denis, and thence to Fort-de-France, where he expired at eleven o'clock of the morning of September 1 — a man honored by all.

At the Hôpital of Fort-de-France I had the advantage of an interview with a lovely French girl of perhaps seventeen years, Mlle. Desirée Martin-d'Harcourt, who had been brought down as one of the wounded from Morne Rouge, and who gave me a very intelligent statement of her impressions of what had taken place on the evening of the 30th. Her mother, more burned than herself, and also her brother, were being cared for in the same room. The family had retired for the night, not being able to stand the strain which the roaring of the volcano imposed upon them any longer, and firmly secured the house, closing everything. Shortly after nine o'clock a dull detonation was heard, and the outer shutter (*sous-le-vent*) was released from its bar fastenings and swung open. Instantly the hot blast entered and commenced its terrible rasping work. Mlle. Desirée was confident that it was luminous or electric in character. Refuge was sought under the beds, and mattresses were hauled down to cover the protruding feet. At this time, thinking that the storm had passed, Mme. Martin-d'Harcourt opened the door, only to admit a second and stronger blast, to which she nearly succumbed. All experienced extreme difficulty in breathing, but the sensation of choking was only momentary. Sulphurous odors were strongly perceptible. The Martin-d'Harcourt home was one of the better properties of Morne Rouge, and doubtless owed its escape from destruction to superior construction, as it stood sufficiently exposed to the storm. Mme. Martin-d'Harcourt succumbed to her wounds the day following my visit."

After his Return from Martinque

For a number of days following the destruction of Morne Rouge Mr. Heilprin was cut off from communication with the outer world, and there were reports in the papers that he had lost his life in the catastrophe. His relatives were in the greatest anxiety until, after days of suspense, a brief cable despatch

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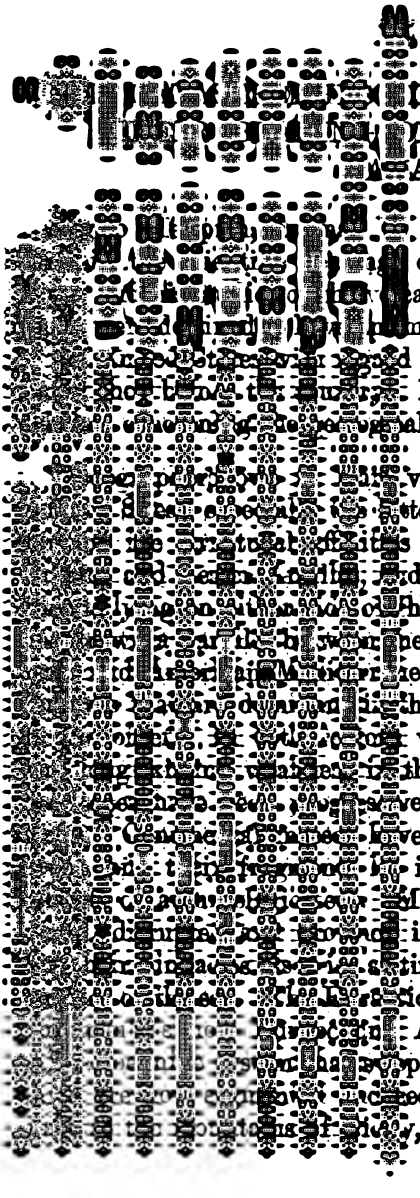
replied, 'just say that it was a narrow escape — that term is quite expressive enough — and say that I was rather fortunate.'

In other words Professor Heilprin went to his danger dispassionately, stood it calmly, and then forgot what peril he had undergone. He merely retained the impressions of what took place and dismissed all speculations of just how many inches he had been from death."



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Mountains and the Sierra Ronda of Spain. Around this vast region of weakness, of bodily subsidences, great ridges have been towered up, and it is these mountains which are now in part undergoing breakage. Professor Suess has shown, and in a way that cannot be easily contested, that where these great continental breakages are taking place they are associated with volcanic and seismic disturbances, as, indeed, one would be obliged to assume on any theory that connects volcanic outputs with pressure exerted by an outer crust or shell upon a molten interior lying a short distance below it, or holds that volcanic discharges take place along lines of weakness where escape of material from the earth's interior is made easy.

We find in and about the Mediterranean basin the active volcanic cones of Vesuvius, Etna, Stromboli and Santorin, and the extinct, but hardly less than modern, Castellfullit Mountains of Catalonia, Spain, the Euganean Hills of northern Italy, the Alban Mountains of central Italy, the Tokai and Sátor Mountains of the northern Hungarian plain, and the loftier summits of the Caucasus, Elbruz and Kasbek, dominating a basin that is structurally a continuance of the Mediterranean. In all these cases it is found that the volcanoes, whether new or old, stand closely by the mountain range whose development or destruction brought them into existence, and usually they define the inner or concave side of their trend. It was there that the greatest pressure was exerted and relief from pressure found.

Characteristics of Two Seas

It is not now difficult to recognize a broad parallelism between the western included waters of the Atlantic basin, the Caribbean and Mexican Seas — which may properly be termed the American Mediterranean — and the two basins of the Eurafrican Mediterranean. Both seas lie between continents, the American less directly so than the European. In both the depth of water is strictly oceanic (upward of twelve thousand feet), and both have lofty mountains associated with them in some part of their periphery. Again, both have their island groups or lines, and the volcanoes that lie close

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touching the southern confines of what are now Cuba, Hayti, Porto Rico, etc. Beyond this border may have stretched eastward or northeastward, to a long distance, a continental area that was largely continuous with South America. And for any facts that geology has to show to the contrary, this eastward extension of the southern continent may well have continued, as has been argued by some geologists, quite into the Old World, uniting at least with Africa; for there is good reason to believe that the southern basin of the Atlantic Ocean came into existence only at a later day.

The Lesser Antilles

The islands of the Lesser Antilles as we to-day recognize them are constituted of two groups, an easterly and a westerly, which in close position form a crescentic line extending from Trinidad to the eastern extremity of Porto Rico, or across seventeen degrees of latitude. The outer or Atlantic islands, which occupy the convex side of the crescent, are fundamentally of limestone or conglomerate construction, joined to more ancient igneous and metamorphosed rocks, and are of a continental type, while those of the inner side are volcanic, and, counting from their principal members, — Saba, St. Kitts, Nevis, St. Eustatius, Redonda, Montserrat, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada, — about a dozen in number. These volcanic islands, which all bear evidences of recent volcanic activity and belong to a period of no great geological antiquity, — perhaps nowhere more ancient than the Middle Tertiary, — unquestionably define one of the lines of greatest weakness in the Caribbean or Antillean region, and they stand implanted upon or adjoined to the old continental basement, whose fragmented parts still appear in such remains at St. Thomas, St. Croix, Anguilla, Antigua, the eastern island of Guadeloupe, and part of Barbados, — islands of sedimentary construction, and which after their subsidence have in part been built up by organic growth and volcanic discharges. No more extraordinary series of volcanoes is to be found anywhere than that of this inner line of islands, which have sometimes been designated the Caribbees, and nowhere is a volcanic disposition

to be found that is more beautifully identified with terrestrial movements, whether of subsidence or breakage. The Lesser Sunda Islands, Japan and the Aleutian Islands alone present parallels. Both on the east and the west, *i. e.*, on the Atlantic and Caribbean sides, the islands rise rapidly from deep water — more rapidly on the inner or western side — and between each two placed north and south, although the interval may not be more than twenty or twenty-five miles, or even less, the separating water has in most cases a depth of at least three thousand feet, and frequently much more. The islands, again, present the extraordinary peculiarity of having their highest summits brought to approximately equivalent heights, or at least to levels which have no marked preëminence; thus, Saba, which is hardly more than a rock rising from a fairly deep sea, is 2000 feet high; Mount Misery, on St. Kitts, is 4300 feet; the Soufrière of Montserrat, 3000 feet; the Soufrière of Guadeloupe, 4070 feet; Diablotin, on Dominica, 4740 feet; Mont Pelée, on Martinique, about 4300 feet; the Soufrière of St. Lucia, 4000 feet; and the Soufrière of St. Vincent, 4050 feet. It is not possible to say at this time to what extent these different volcanic masses may be united with one another in the trough of the sea, and there form a continuous volcanic ridge with elevations of seven thousand or eight thousand feet rising out from it. It would seem more likely that their connecting bond is the continental basin, on whose crest, or along whose fractured parts, the volcanoes have been built up. This conception is seemingly more in harmony with what we know of the linear disposition of volcanoes elsewhere, as, for example, in the peninsular and insular tracts of extreme Asia, the Aleutian Islands, etc.

Origin of the Subsiding Eras

In assuming in the Caribbean and Gulf basins two great subsiding areas, one is not necessarily forced to the assumption that their origin as such dates from the same period of time, any more than we accept that the two basins of the Mediterranean were necessarily formed contemporaneously, or that the eastern basin is of the same age as the Black Sea. But they have become isochronic, so far as their present dynamics are concerned. They

reak, squeeze and press, and as a resultant, lands are folded p and volcanic discharges brought to the surface. There are o facts in geology that are more difficult to establish than those hat are associated with the first appearance or making of land-nasses and the causes which have brought them into existence; nd much room for doubt must always be permitted in the in-erpretations of the conditions that suggest themselves in in-quiries of this kind. In the case of the Antillean region, how-ever, it may be assumed as fairly well established that the singu-lar peninsular extension of the United States, the State of Florida, is the resultant of a lateral thrust, with upfolding, brought about by the subsidence or deepening of the Gulf Basin; and one may accept with nearly equal certainty a like or cor-relative explanation for the existence of the peninsula of Yuca-tan. We may, indeed, assume with De Montessus the hypothe-sis that the comparatively recent upheaval of parts of the Lesser Antilles is in itself merely the expression of an upthrust be-tween two subsiding basins — the Atlantic on one side and the Caribbean on the other.

Were we to seek for an absolutely homologic equivalent of the American Mediterranean basins in the Mediterranean region of Eurafrica, it would be impossible to find it, since the continen-tal relations of the two regions are not wholly alike, nor are the mountain parts similarly placed. But it is immaterial how the individual parts are placed geographically or how they are interrelated — their geologic aspect or *Antlitz* is fundamentally the same. M. Michel Lévy has latterly made a comparison be-tween the two regions, and has assumed a homologic equivalent between the Caribbean and the Gulf basins on one side and the Ægean and Black Seas on the other — the Black and Gulf seas being the included basins in the two cases, the Dardanelles, Bos-porus and the Strait of Yucatan the connecting waters, and the volcanic Caribbees and the Candian islands the concave outer rim marking the breakage of the main basins. This comparison is interesting as it recognizes an existing homology, but it can hardly replace the broader comparison which is forced upon us by the larger regions of which the Euxine-Ægean is merely a part.[1]

[1] Revue Générale des Sciences, June, 1902.

The Region of Weakness

The boundaries of the region of weakness that is included within or touched by the Caribbean-Gulf basins may be roughly drawn from the western coast of Mexico to the Lesser Antilles, or over an east-and-west extent of thirty-six degrees of longitude, and form the northern parts of South America to Porto Rico and the lower parts of the Mississippi Valley. Practically the whole of Central America is included in this region, whose area may be approximately put at twice that which is represented in the Mediterranean region of Europe. Nearly the whole of this tract, and much of the region that immediately adjoins it, is characterized by violent seismic and volcanic disturbances, and probably no region of the globe, with the exception of that of the Molucca Seas, has been witness to greater catastrophic events and to a grander concentration of volcanic figures than this one. One has only to recite a few of the more salient events of modern date in the course of these phenomena to properly punctuate the history of this region: the eruption of Jorullo, in Mexico, in 1759; the destruction, by earthquake, in 1773 of the city of Guatemala (Antigua); the formation of the volcano of Izalco, in Salvador, in 1793; the earthquake of Caracas, in 1812; the eruption, in April, 1812, of the Soufrière of St. Vincent; the catastrophic eruption in 1835 of Coseguina, in Nicaragua — one of the most violent eruptions recorded in history; the destruction by earthquake of Cartago, in Costa Rica, in 1841; and the rapidly following events of this year: January 16, destruction by earthquake of Chilpancingo, in Mexico; April 18, destruction by earthquake of Quezaltenango (and other towns), in Guatemala; and May, the eruptions of the Soufrière and Mont Pelée, in St. Vincent and Martinique.

A Region of Instability

There is perhaps nothing that so clearly establishes the unity of the Gulf-Caribbean region as a region of far-reaching instability as the broad range of its seismic and volcanic phenomena and the correspondent relations which they teach. No succession of events could present this fact more lucidly than the events of the

early part of this year, 1902, when disturbances of one kind or another were developed over a linear area of nearly or quite two thousand five hundred miles, extending from Colima, in Mexico, on the west, to Martinique on the east. The areal distribution of these occurrences is, indeed, so vast that one is almost prompted to deny the existence of any true relation binding them together; but the evidence obtained from similarly concurrent events in former periods of time leaves no room for doubt that the association, which naturally fastens itself upon the mind, does in fact exist. The synchronism in the time periods of the eruptions of the Soufrière of St. Vincent and Mont Pelée, as developed in their recent activities, is too patent to permit of any question being raised as to their relation to a common disturbing cause; and perhaps not before has such a close relation been recorded. The cataclysm of May 8, in Martinique, was preceded by one day by the main eruption of the Soufrière, which, however, continued in nearly full activity for twenty-four hours afterwards; the Pelée eruption of the 20th of the same month was preceded, with a nearly equal time interval, by a second eruption of the Soufrière; while the second death-dealing eruption of Pelée on August 30 was followed four days later, and after an established period of quiescence, by what seems to have been the most violent of all the recent eruptions of the Soufrière, on September 3–4.

Various Soufrières

A careful inquiry and examination made at several of the other volcanic islands lying in the chain of the Lesser Antilles, St. Lucia, Dominica, Guadeloupe, Montserrat, and St. Kitts, all of which have soufrières or craterlets emitting sulphurous or heated vapors, establishes the interesting fact that their points of activity were not even to the slightest degree influenced by the eruptions of early May, the crateral bodies of water, whether standing or boiling, retaining their old temperatures, and giving out neither more nor less of vapor. This condition is made to appear the more surprising in the case of the Soufrière of St. Lucia, an island that stands half-way between Martinique and St. Vincent. The island thus appears side-tracked, so far as the

existence of any connecting fissure may be postulated. It should be noted, however, that the position of the St. Lucia Soufrière is not longitudinally concurrent with the positions of Pelée and the Soufrière of St. Vincent, lying considerably to the eastward. And it is remarkable, or at least noteworthy, that just westward of this island, seven to ten miles beyond the coast, marked oceanic disturbances, taking place at the time of the great land eruptions, were observed, and were considered to point to true eruptions having their origin on the sea-bottom.

As in 1812, the great May, 1902, eruption of the Soufrière was preceded by violent seismic disturbances in the northern part of South America, particularly accentuated in Colombia and Venezuela, and in closer chronologic harmony by the great earthquake which on April 18 destroyed the city of Quezaltenango, in Guatemala — seemingly the most destructive earthquake in the western hemisphere since the one which in 1812 wrecked Caracas. So close, indeed, is this association, and so intimately correlated appear to be the volcanic and seismic phenomena of the vast Caribbean region, that Professor Milne has ventured the suggestion that it was this earthquake, or rather its prophetic force, which brought about the eruption of Pelée. However possible or impossible it may be to prove the correctness of this view, it is certainly very interesting and suggestive.[1]

Fallacious Belief in Future Safety

As regards the intensity of the volcanic and seismic conditions of the Gulf-Caribbean region, it has frequently been asserted by geologists and others that it is rapidly on the decline, and that we could look to a comparatively near period when a full or nearly full condition of stability would be established. That there has been a marked diminution in these phenomena since a prehistoric period, when the volcanoes were first formed, or for a long period after their formation, does not, it seems to

[1] A violent earthquake with sharp detonations was noted at Carúpano, on the Venezuelan coast, on the night of August 30, at about nine o'clock. It is an interesting fact that almost coincidentally with the construction of the volcanic cone in the Lake of Ilopango, in Salvador, there were violent seismic disturbances, with a southwest to northeast movement, in the Vuelta-Abajo district of Cuba (January 22–23, 1880).

me, admit of doubt; but I fail to find the evidence that points to any recent decrease of power or to that near future of quiet repose which is assumed to follow dormancy. In various papers discussing the relative merits of the two interoceanic canal routes, Nicaragua and Panama, I have sought to point out the fallacy of the notion that a half century or more in the history of an active or semi-active volcano serves as a proper guide to the elucidation of the possibilities of such volcano or that it is necessarily in any way a measure of the volcano's potential energy. It seemed to me far more probable, seeing that we had in the 1835 eruption of Coseguina one of the greatest paroxysms of the earth's history, that the volcanic and seismic phenomena of at least a part of the Caribbean region gave indications of an increase rather than of a decrease of power, and I pointed out the bearing of this condition on the problem of canal construction. Since the appearance of these papers, the world has been startled by the destruction of Chilpancingo, on January 16; the destruction of Quezaltenango, on April 18; the eruption of the Soufrière on May 7; and the death-dealing eruptions (besides other eruptions of almost equal intensity, May 20, June 6, July 9) of Pelée on May 8 and August 30. These, together with the long-continued eruptions of Colima, in Mexico, now extending through a period of ten years, appear to me to be part of one and the same general disturbance in a localized, even though vast, area of the earth's crust. As to the future, and what particularly concerns the forces of the Lesser Antilles, it is difficult to postulate; but there does not appear to me any good reason for assuming that we are about to enter upon a condition of peace. Rather should I believe that we may be facing a period of long-continued, even if interrupted, activity; and that we may even be nearing a period whose distinguishing characteristics may be cataclysmic. The Caribbean basin is recognizably one of breakage, and its phenomena can easily be those that result from this condition."

Influence of his Views on the Senate Debates

The influence of Professor Heilprin's scientific authority upon the debates in the Senate concerning the proposed inter-

oceanic canal was thus set forth in an address by Mr. Louis E. Levy, in commemoration of his friend, delivered before the Franklin Institute, Philadelphia, September 18, 1907:

"The respective merits and difficulties of these two routes had been debated for years by experienced engineers, by learned geologists, by journalists and by statesmen, and when the choice was finally to be made by act of Congress, the Senate wavered in its decision, many of its members remaining undecided in their opinion. At this juncture Heilprin, then investigating the volcanic conditions attending the catastrophe at Mont Pelée, announced his conclusions through the Philadelphia *Press*. In a telegram to that journal he said: 'My studies of what has happened here throw added light on the Isthmian Canal question. The catastrophism here is without parallel. Its relation with conditions at St. Vincent establishes the certainty of a long volcanic circuit, whose existence should dispose of Nicaragua as a canal route.' His telegram closed with the statement that 'The facts all prove the broad reach of volcanic force, and that reliance for the protection of a canal running through a volcanic country like Nicaragua, on the localization of volcanic force, its assumed dormancy, or the resistibility of the canal to its destructive action, is absurd.'

The effect of this announcement was decisive. It brought conviction to the minds of Senators who had remained unconvinced by the arguments presented by Senator Hanna and other leading advocates of the Panama route, and left the Nicaragua project but a small minority of supporters, headed by Senator Morgan of Alabama. But it was not only in Congress that Heilprin's authoritative announcement brought conclusion to this much vexed question. His investigations influenced public opinion on the subject throughout the country and settled it permanently in favor of the Panama route."

York

VII

THE TOWER OF PELÉE

The development of the giant obelisk of rock known as the "Tower of Pelée" was a phenomenon which exercised a peculiar fascination upon Professor Heilprin. He revisited Martinique in order to study all aspects of the phenomenon. In a letter to the *Nation,* dated August 20, 1903, he wrote:

"Not quite a month after the first anniversary of the destruction of Saint-Pierre, I again set foot on Martinique soil. A torrid sun was beating down upon the prairie-like *savane* of Fort-de-France, and the tall and richly umbered royal palms that shadow the statue of Josephine had already long begun to show the passing of the rainy season. This is the hot side of the island, and if a temperature of 86 or 87 degrees carries with it no particular terrors, and is not uncommonly high for a region that lies only four hundred miles from the mouth of the Orinoco, it is still something that warns, and compels consideration where an unusually high degree of humidity pervades the atmosphere. There were not many people about, and the city of 12,000 inhabitants showed its usual appearance of monotonous decay. Fort-de-France is perhaps as intensely uninteresting as Saint-Pierre was the reverse, and even now, when it has entirely replaced its fairer sister as the centre of population of the island, it does nothing to relieve itself of the air of weariness which is its chief characteristic. I found no change in the doings of its people since September. Newspaper politics were, as heretofore, running high, and the editorial columns of *L'Opinion* and *La Colonie* were waging the old 'war of races.' The volcano was still a part of the hourly food, and its workings were officially chronicled almost daily; but there seemed to be few who were more than passively interested in the extraordinary structure that it

had developed — the gigantic obelisk of rock which transfixes the crater-cone, and, like a veritable Tower of Babel, towers over the summit of the mountain to a height of 800 feet and more. And, incredible though it may appear, there are still hundreds and thousands of the inhabitants who to this day have not visited Saint-Pierre.

The silent city remains much as it was at the time of my last visit, nine months before. A little more ash has accumulated here and there, and some of it has been taken off elsewhere; but the ruins are the same battered, crumbling walls, unchanged save that they have gained in color through the washing off of the ash-mud that plastered and cloaked their vertical sides. In a few places excavations were being made to recover 'treasure' or to locate sites, but the prowlers among the dead were few, and what was recovered was in most cases insignificant. I turned over some rubble-masses beneath which 'caked' and burnt papers were projecting, and found that I was dealing with a lesson in geology, and, strangely enough, with one that taught of volcanoes and volcanic phenomena. Several pages of manuscript, possibly escaped from the Lycée or the Communal College, covered with teachings of Vesuvius, Cotopaxi, and Etna (and of Pelée?). It may be that those papers were dictated by the impending storm of Pelée, but who can now tell? The fragment of one of the few books recovered from Saint-Pierre — whose precious brown pages I owe to a friend — deals likewise with volcanic phenomena. It is the 'L'Enfant du Vésuve,' supplemented with a very full account of the destruction of Pompeii, and with a carefully rendered translation of both of Pliny's letters.

One significant change has come over Saint-Pierre. It is no longer an absolute desert, for little colonies of ants and other insects are inhabiting the ruins, and the land-snail has come to live with them. Green creepers and many plants with bright flowers here and there hang about the battered masonry, and from some of the old gardens rise up stocks of the *chou caraïbien* and the banana. And even the few trees that have been left standing on the surrounding heights, and thought to be dead, have sprouted out new leaves, and give a new sunshine to the landscape. Well up on the volcanic slope, beyond the Roxelane,

and quite to the Rivière des Pères, these signs of returning vegetation are apparent, and on one side of the Roxelane itself everything is green. But, after all, it is more the immediate foreground that gives these signs of resuscitation, for, farther beyond, and below the hanging volcanic cloud, the grays are as gray as ever, and the valley of the Rivière Blanche, choked with the immense amount of débris that has been thrown into it, is white like snow with the new ash that is periodically being swept over its course.

At Morne Rouge, which fell in the storm of August 30, not a house remained inhabited. The beautiful church under whose partially lifted roof good Père Mary had sought refuge for nearly his last hours, still stands with its foot in the ash. My attendant climbed into the belfry and tolled the bells that hung uninjured from the posts. It was the voice in the wilderness, for there were none to listen to it but ourselves. Perhaps far away on the hillsides, where specks of cottages appeared in the surrounding green, some may have recognized the beautiful resonant tones.

The exquisite woodland that, previous to August 30, bordered most of the road between here and Ajoupa-Bouillon, stood out now as ragged tree-trunks, spectres in the destroyed landscape, with naked arms and upturned roots, begging, as it were, from the new sunlight that surrounded them. Here and there the eye fell upon the returning fronds of the tree-fern and clumps of bamboo, on the melastome and broad-leaved heliconia; but they were merely visions of what had been before.

On June 13, in company with one of the officers of the French Scientific Commission, I made my fourth ascent of Pelée. The passing night promised everything. A few high clouds hovered about the blue and receding mornes that stretched off toward Carbet, but over the volcano itself there was nothing, and the great obelisk, its base fiery red with the molten lava that was being poured into it, stood out in bold relief against the green-blue western sky. We left our quarters early, so as to gain upon the clouds that viciously gather about the summit; but the clouds had preceded us, and already at the breakfast hour, by which time we had reached the former summit, everything was wrapt in cloud and mist, and little was visible beyond our-

selves. We succeeded in steering a course across what had before been the basin of the Lac des Palmistes, and in a few minutes stood upon the edge of the great crater. Everything was gray within — not silent, however, for avalanches of rock were being precipitated and tumbled about in ruthless manner, and an occasional ominous roar told that the spirit of the mountain had not entirely departed. For the better part of six hours we vainly strove to penetrate the sea of cloud and fog that hung ahead of us. Each coming gust seemed to give us the chance for which we were waiting, but the rising crater-vapors kept the basin full, and even under a clear sky they allowed only 'memories of a landscape' to escape. Although in no way unbearably hot, I found the crater rim uncomfortably warm and humid; it seemed to me more so than on my earlier visits. The actual temperature was only 85 degrees, however.

Shortly before two o'clock, the opportunity for which we had so impatiently waited seemed finally to have arrived. Clouds and vapors died down to one side, and the great tower, its crown hanging at a dizzy height above, began to unfold. Piece by piece was added to it — purple, brown, and gray — until at last it stood abreast of us virtually uncovered from base to summit. The spectacle was one of overwhelming grandeur, and one can hardly conceive of its terrorizing aspect. Nature's monument dedicated to the 30,000 dead who lay in the silent city below, it rises up a huge monolith, 830 feet above the newly constructed summit of the volcano, and 5,020 feet above the Caribbean surface. Nothing of this kind had ever been known to science before, and I felt — although not the first in the field to observe it — that my footsteps had been guided to an unknown world. None of the grandest scenes of nature which I had before seen — the Matterhorn, the Domes of the Yosemite, the colossus of Popocatepetl rising above the shoulders of Ixtaccihuatl, the Grand Cañon of the Colorado — seemed to impress me as this one did; and I am certain, at this distance from the field of observation, that none was more sublime. More restful scenes there certainly are.

In its geological conception, the 'Tower of Pelée' means the extrusion vertically of a mass of solid lava, which in its nonfluent condition has been forced out in this way by the

olcanic stress reacting upon its base. The entire tower, 300–50 feet thick where its base is implanted, and with a height wice that of the Washington Monument in Washington, is till being pushed up bodily, and at a rate that is all but incredible. During four days of my residence at Vivé the rise, as determined by the French Scientific Commission, was twenty-ne feet; and the rate of ascent was far greater still in the preceding month. On the side where the great obelisk has pressed hardest on the encasing rock, the surface is smoothed, almost polished, and shows parallel lines of grooving. The other sides are slaggy, and bear evidence, especially on the side directed to Saint Pierre, of recurrent periods or episodes of eruption. These have not yet ceased.

The great volcano of Martinique is now 'plugged' or 'corked.' How long it will remain in this condition, or how soon it may pass through another paroxysm, the future alone can determine. For the present the mountain presents alike to the tourist and the scientist an object of supreme interest."

The Shattered Obelisk

On this and on subsequent occasions Mr. Heilprin took many photographic views of the obelisk, and after his last visit to Martinique, in 1906, he published in the *National Geographic Magazine* a paper on "The Shattered Obelisk of Mont Pelée," in which he furnished some additional theories to account for the origin and construction of the tower. He said:

"Of the remarkable phenomena which enter into the history of the recent activities of Mont Pelée, and of the activities of volcanic mountains generally, few have attracted more widespread attention than the extrusion, through the Pelean apex, of a core of rock which, at the time of its greatest development, attained a height of upward of a thousand feet. This block of rock, which thus rose the better part of twice the height of the Washington Monument, in the city of Washington, and had a thickness at its base of from 300 to 500 feet, was a fundamental part of the history of the volcano for upward of a year, not improbably already existing in a minor or concealed form

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Saint-Pierre, now a disappearing ruin in an encroaching jungle, and on the second day following made my way over to the northeastern side of the island and established myself as heretofore, under the hospitable roof of the Usine Vivé. On February 27, starting from the Habitation Leyritz, when the tree-toads were still croaking and when Nature shrouded the landscape in a veil of darkness, M. des Grottes and myself, with two assisting carriers, bore off to the easy arête which steadily moves up to the summit of the volcano. A nasty rain, which came and went with intervals, dogged our trail for the better part of an hour and added little comfort to the little that goes with these trips. Once on the open slope of the volcano, however, everything went well, and my mount, the Arabian 'Mocha' did its share of the journey in an unusually pleasant way, showing only scant signs of fatigue up to the point where conditions made it desirable to leave the animals. This is now considerably more than half way up the mountain.

We gained the summit, in a not particularly satisfying drizzle, shortly before eight o'clock, only to find that little was to be seen beyond. The crater basin was full of shifting clouds and vapors, and only in rarest snatches could we pick up through thinning areas the form of the massive dome and of its covering debris. At the spot where we reached the crater-wall, by some of the good people of the region facetiously called the *salon*, there were marked evidences of recent slipping and subsidence, and for some distance back of the border new separating lines told plainly of the reaches that before very long were to be added to the crateral hollow. A shift in the wind brought the greater part of the dome momentarily into view, and also cleared up what remains of the old Morne de la Croix. Its flank, a short distance from the brink, carries the new cross which in great state was planted on the 14th of September last. On this day Pelée was in gala form, for not less than six hundred inhabitants of the island formed part of the procession that followed the cross to the summit, moving up in a long continuous line that to some may have been reminiscent of the Chilkoot trail. A minor wooden cross has also been erected near the eastern border of what was formerly the basin of the Lac des Palmistes.

Following the rim of the crater along its northern face, or in the direction of the Petit Bonhomme, we found a spot where it seemed that a descent might be made over the very sharp knife-edge, and where, indeed, an earlier descent had already been made by my associate, together with two companions, MM. Salet and Beaufranc. A very stiff wind was unfortunately blowing over this crest, and for a time it seemed that its persistence would thwart our effort to gain the rim. My own affairs were not particularly encouraging either, for I had but one good foot, and dragged another as a reminiscence of a mishap on board the steamer of our voyage. Once over the rim, however, we were on fairly easy ground, and the scramble to the bottom was quickly made. Here we were immediately brought into contact with the parts of the obelisk, which were lying about everywhere, almost completely cloaking the body of the dome itself and measurably filling in the horseshoe-shaped area of the old crater basin. Close to the point of our descent the depth of the crateral cavity could hardly have reached a hundred feet. Westward of our position it was still less, while directly under the old Morne de la Croix it may have more nearly measured 150 to 200 feet. The dense vapors (in the absence of an aneroid) did not permit of any accurate determinations of depth at this time. The width of the hollow at its base had been reduced to hardly more than a rock-space in some places; elsewhere it widened out to a number of yards, and from its boulder-strewn surface steam was issuing in scattered jets.

Having secured the necessary footing, we almost immediately began the attack upon the dome itself, a sufficiently easy undertaking in the present condition of the volcano and requiring no care beyond that which attaches to the wise caution of looking where you walk. Loose boulders would be sent from time to time flying down the slope, giving out that peculiar sound, as of breaking glass and china-ware, which had already been noted by those who had made the early ascents to the crater rim, and as far back as the close of May, 1902. This 'vitreous' or clinkery sound had been attributed by some — among whom I must class myself — to a possible vesicular or obsidian-like structure in the falling rock masses; but manifestly the

condition was independent of this structure, for we found the rock to be everywhere of compact form, destitute of gaseous cavities, and nowhere even approximating obsidian in aspect or composition. Petrographically it is a light-gray, fine-grained hypersthene-andesite, of almost holocrystalline texture and differing but little from some of the older rocks of the volcano. It seemingly belongs to type IV of Lacroix's classification of the ejected products of Pelée (quartzitic andesites), although some give a faint indication of loose aggregation (approximating the rocks of type III?), perhaps resulting from weathering, or, what seems to me more likely, the action upon the surface of superheated steam or other gases. As before remarked, we found no scoriaceous, clinkery, or vesicular masses of any kind, although it might be going too far to say that such do not exist buried up in the wilderness of material. At two points on the dome we came upon the extruded smoothened surfaces of the "ribbing" which forms part of the true structure of the dome itself, and found them to have virtually the same lithological characters as the boulder masses beneath which they were in greater part covered.

Having gained a point on the dome which, at times of clearing vapors, well overlooked the wall of the Morne de la Croix, and beyond which the further ascent is complicated by projecting pinnacles and a disagreeably steep gradient, we drew the line of our journey and turned our steps downward. Somewhat more caution was necessary in this descent than in the ascent, but without mishap the bottom of the *rainure* was found, and a slow, steady pull brought us again to the rim of the crater-wall. The wind was still blowing a semi-gale in this quarter and clouds hung heavily over the vertical summit of the volcano. Now and then the basal wreck of the great obelisk protruded its tooth-like form through the shifting vapors, giving to the mountain an aspect of savage ruggedness.

When before this visit I last stood on the crater rim the great obelisk of rock, like a veritable Tower of Babel, still rose 840 feet, a sheer precipice, above the summit of the dome which to-day bears merely a serrated crest. At that time, in the middle of 1903, the fires of the volcano were still burning, and steam and sulphur vapors were being puffed in great clouds

through the mass of the dome itself, and through the zone of contact that united the dome with the gray and silent rock that rose out from it like a giant plug or cork. At that time, and from that time nearly to this, the geologist was still in doubt as to the precise characteristics of this singular volcanic excrescence — unique apparently in our world, but not unlikely duplicated in some of the tall objects, sending nearly straight shadows, which appear in some of the large crateral pits of the moon — but to-day we at least know what was its constructural rock material, even if a considerable doubt still attaches to the precise method of its formation.

The view that is seemingly most generally held by geologists as to the origin and construction of the Pelée tower is that which has been advanced, and so ably elaborated by Professor Lacroix, the chief of the scientific commission sent out by the Academy of Sciences of Paris to investigate the happenings on the island of Martinique. This view is, in its simplest terms, that the giant rock mass represented a rapidly and recently cooled highly acidic lava, whose tension and viscosity were such as to permit of solidification at or about the time of extrusion; it belonged to the present period of eruption, and thus took the place of the free flows of lava which are ordinarily an accompaniment of the normal type of volcanic eruption. The pressure exerted on the ascending magma by the solidified dome which is thought to have closed over the central orifice is considered by Lacroix to have been an important factor in the production of solidification, even if not its absolute determinant.

While seemingly simple in its explanation, there are yet many difficulties in the way of the acceptance of Lacroix's hypothesis, and some of these I have pointed out, in advance of the publication of the monumental *La Montagne Pelée et ses Éruptions*, in my 'Tower of Pelée.' A few of these, to which others are added, are here enumerated:

1. The hypothesis of M. Lacroix compels a belief in the rapidity of the cooling and solidification of large lava masses which is seemingly at variance with all knowledge that we possess regarding the behavior of rock masses in fusion. The Pelée obelisk, although rifted much in the manner of the jointing of other rocks, was virtually solid to the core, and none of

its decapitations disclosed moving fluid lava in the interior. We are thus forced to believe that a full cooling and solidification of the constructing lava mass had in an almost incredibly short space of time extended completely through the substance of the extruding part. At the time of its final disruption, in the early autumn of 1903, it is true that the basal scar was described as being a vast glowing brazier; but I should say that this condition was brought about by the forcing into the base of the monolith of some of the same lava which elsewhere was oozing out, and constructing, or helping to form, the supporting dome. Indeed, it may well be that the destruction of the obelisk was brought about largely by an 'eating' into the mass of burning lava.

2. The hypothesis involves the assumption that the tower or obelisk was one of the later constructions associated with the awakening of the volcano, having been *preceded* in time by the construction of the dome, and its rise is dated back only to the middle of October (or November) of the year 1902. But, as has already been intimated, there are grounds for believing that it already existed within the chimney of the volcano as early as the fatal 8th of May, and its presence there as an obstructing 'plug' may well have been responsible for the force and downward stroke of the destroying cloud that annihilated Saint-Pierre. There can hardly be a question that the scraggy and apparently cindery mass which I described in my earlier reports as defining a wall in the crater, and which is so well illustrated by Mr. George Varian in the paper (*McClure's Magazine*, August, 1902) which details our ascent of the mountain on June 1, 1902, was the identical rock. While at Morne-Rouge on the day following (June 2), Père Mary assured me that three distinct tooth-like structures were plainly visible from the belfry of his cathedral, 'looming up' above the crater's rim.

3. Professor Lacroix has pointed out, what seems to me to be in opposition to his own views, that the volcano had for several weeks maintained a condition of parallel (opposed) activity at the summit: the construction of a fluidal dome and the simultaneous erection of a rigid spine or tower. It would be difficult to explain this divergent condition on any theory

of almost instantaneous cooling of outwelling lavas. One could hardly expect to find an outwelling mass so behaving as to lend itself to the formation, at or near the same place and under very nearly similar conditions, of two structures which were so largely dissimilar in habit as the fluidal dome and the rigid spine. If the substance of the dome was able to maintain its fluidity, it might reasonably be argued that the mass of the obelisk would have been able to do the same. On the other hand the divergent condition is entirely consonant with any theory that holds that the extruded rock was an ancient rock core that had been bodily lifted from its moorings, and that it bore no relation in its making to the newer activities of Pelée. This is the view that I myself hold and is that which I have enunciated elsewhere. M. Lacroix has in many places pointed out that the mechanics of the two structures were independent of one another.

4. On the theory of a rapidly solidifying lava, one would naturally expect to find the surface of the cooling body giving out vapors from its inner parts, but the Pelée obelisk, except, perhaps, along lines of rifting or near its base, never, so far as I am aware, exhibited this peculiarity, the tower of rock looming up at all times grimly cold and dry, and with much the appearance of steam having acted upon its surface.

To the objections that have here been stated others less direct might also be urged. My recent journey has, perhaps, not contributed much to the elucidation of the subject, except in so far as negatively it has failed to determine, in an examination of much rock material, any evidences of recent solidification of the same. To this extent, therefore, it tends to support my contention, that the obelisk of Pelée was an ancient volcanic plug which bore no relation in its formation to the newer phase of eruption of the volcano, and was lifted bodily, as the result of extreme volcanic stress, in the manner of the great block of granite (and domite?) of the Puy Chopine, in the Auvergne."

VIII

VOLCANIC AND SEISMIC DISTURBANCES

The question of the inter-relations of volcanic and seismic disturbances was discussed by Professor Heilprin in a volume which appeared, posthumously, in 1908 (*The Eruption of Pelée:* A Summary and Discussion of the Phenomena and Their Sequels. Printed for the Geographical Society of Philadelphia by J. B. Lippincott Co.). In it the author said:

"One of the most significant facts associated with the Antillean upheavals of the year 1902 is the extent of territory over which earthquakes and volcanic disturbances of a single or identical period of activity manifested themselves. From southern Mexico in the west to the Lesser Antilles in the east we have an interval in a direct line of not less than 1800–2000 miles, and along or near this line disturbances have been registered in Costa Rica, Nicaragua, Salvador, Guatemala, and Mexico. The remarkable crowding of the phenomena is such that one cannot well resist the conclusion that they are all inter-related or hold a mutual relation to a single inciting cause, and are not coincidental in their occurrence. The more salient facts connected with these disturbances are briefly:

The destructive earthquake of Quetzaltenango, in Guatemala, on April 17–18, 1902, at almost precisely the time when Pelée first seriously manifested its new activity; the renewal of activity, immediately after the earthquake, and at a distance of nearly 200 miles, of Izalco, in Salvador, a volcano whose energies had calmed down for a number of years, but which was in full activity on May 10, two days after the Pelée cataclysm; the eruption on May 7, of the Soufrière, in St. Vincent; the cataclysm on May 8, of Pelée, followed, as in the case of the Soufrière, by violent disturbances extending into Septem-

ber or October; the opening up of the Santiago, or western, crater of Masaya, in Nicaragua, about the middle of July, 1902, with a well pronounced activity continuing into July, 1904; the eruption on October 24 (continuing to Nov. 15) of Santa Maria, in Guatemala, a volcano situated close to the seismic field of Quetzaltenango, and for which there is no recorded previous eruption. The relation of these facts, it seems to me, is so intimate as to force the conclusion that they are directly connected with each other, and one need hardly discuss the probability of another interpretation being found for them; and it was not without reason, therefore, that Milne early advanced the view that the April earthquake of Quetzaltenango was the real initiator of the series of dual disturbances that followed rapidly upon it. Whether or not one should extend the relation of disturbances so as to include the earlier earthquake which in January of the same year wrecked a large part of the town of Chilpancingo, in southern Mexico, and the reawakening of Colima in February and March of the year following (1903), does not materially affect the problem, as the distance separating Martinique from Quetzaltenango is already so great as fully to satisfy the conditions of the broad deduction which it is my aim here to present. Owing to the fact that these disturbances were developed in what might be termed a single region, and in a region that is not familiar to us in the sense that parts of the world nearer to our homes are, the geologist is not apt to be impressed with the magnitude of the distance that separated them; it is, therefore, proper to state that on the map of the continent of North America it would be measured by the line uniting Galveston with Cape Churchill, on Hudson Bay, or that uniting San Francisco with the volcano of Iliamna, on Cook Inlet, Alaska, or with the volcanic islands of the Aleutian group.

The realization of the important fact that inter-related volcanic and seismic disturbances may manifest their acutest phases of activity over an area of the earth's surface that is measured on a line of 1800–2000 miles naturally opens up a broad perspective of the possibilities in the inner workings of our planet, at the same time that it directs inquiry to the general subject of volcanic and seismic inter-relationships.

I have elsewhere (Paper read before the International Congress of Geologists, held in the city of Mexico, in September, 1906, and paper published in *Science*, Nov. 2, 1906) used the facts, as they appear to me, of the Antillean disturbances, together with others of a like kind drawn from regions remote from the Antilles, as evidence tending to prove that the inciting force of such disturbances may be (and has been) regional rather than local in character and that the generally accepted views of geologists that the far-reaching seismic jars of the earth — the so-called tectonic earthquakes — are independent of volcanic association, might not unreasonably be thought to rest on doubtful premises. At any rate, one may well question whether in the case of some of the seemingly most distinctive tectonic disturbances there is not an absolute association binding them with some form of volcanic activity registered upon possibly a distant quarter of the globe. My own general conclusions as I have stated them are as follows:

1. A broad inter-relationship exists between volcanic and seismic phenomena generally;

2. Inter-related manifestations of volcanic and seismic activity may extend over distances, as measured on the surface of the globe, of hundreds or even thousands of miles;

3. 'Tectonic' earthquakes, so-called, are only doubtfully to be distinguished from earthquakes of volcanic association, or those that have been brought about as the result of deep-seated strain;

4. The slipping, upheaval and torsion of terranes as accompaniments of earthquake action are the resultants of impacts or jars already delivered to the earth's crust, and are not the cause of such jars;

5. Earthquake and volcanic disturbances seem to be the expression of one common interior telluric strain or condition, and this condition may in some or many cases be clearly associated with a pronounced magnetic or electromagnetic quality of the planet;

6. There would appear to be a marked synchronism or close following of major disturbances, whether volcanic or seismic, at distantly removed points of the earth's surface at different periods.

For the facts which have forced these conclusions upon me and inclined me to an acceptance of the Naumann-Humboldt theory of volcanic and seismic relationships in preference to the more modern view of the general independence of the two classes of phenomena, the reader is referred to the article published in *Science* for Nov. 2, 1906.

It is an interesting fact, and one seemingly confirmative of the views that I have here expressed, that the four great earthquakes of the most recent time have been found to be synchronously related to volcanic activity: the September, 1905, earthquake of Southern Italy (Monteleone), associated with a recrudescence of activity on the part of Vesuvius and Stromboli (Mercalli: *Comptes Rendus*, Jan. 17, 1907); San Francisco, with the upthrow of Bogoslov Island No. 3; Valparaiso (Chile), with the outbreak of Chillán (Steffen, *Zeitschrift Gesell. für Erdkunde*, Berlin, 1906, p. 638); and Kingston (Jamaica), with outbreaks of the Central American volcanoes (as reported in the logs of the Pacific Mail steamships). The theory of the probable inter-relationship of earthquake and volcanic phenomena has been made the subject of many important papers, from the time of the earliest geologists to the present day, but it nowhere receives more lucid exposition than in a paper (now, as it seems, generally overlooked) published by Charles Darwin in the *Transactions of the Geological Society* of London (2d series, vol. V, 1840). Among the more notable synchronous events there recorded is the simultaneous breaking out into activity, on Jan. 20, 1835 — shortly preceding the great earthquake disturbances on the west coast of South America — of the volcanoes of Osaruo, in Chile, and Coseguina, in Nicaragua, separated by an interval of upwards of 3000 miles. In my own paper already referred to I cite among other synchronous happenings in seismo-volcanic activity the cataclysm of Kötlugia (Katla), in Iceland, on the day, Nov. 1, 1755, when Lisbon was destroyed by earthquake, and the combined catastrophic eruptions of Skaptar Jökull, Hecla, and Reykjanes occurring coincidently with the great Calabrian earthquake of 1783. The distance separating Iceland from Lisbon is about 1800 miles — therefore, less than the distance that separates Martinique from Quetzaltenango, in Guatemala.

(An exhaustive paper, dealing largely with earthquake and volcanic relationships has latterly been published by Professor T. J. J. See in the *Proceedings of the American Philosophical Society,* Oct.–Dec., 1906. The author's conclusions regarding tectonic earthquakes are largely identical with those which I have here advanced.)"

IX

A JOURNEY TO BRITISH GUIANA

Mr. Heilprin's last undertaking was a journey into the interior of British Guiana, in 1906, the following account of which appeared in the "Bulletin of the American Geographical Society" for September of that year, under the heading of "Impressions of a Naturalist in British Guiana":

"When in 1825 Charles Waterton published his delightful *Wanderings in South America* he gave to the world the first picture of what Anthony Trollope has called the 'true and actual Utopia of the Caribbean Seas, namely, British Guiana.' In it we have presented one of the most fascinating introductions to a region of charm and beauty — an impression of nature which is scintillant with the glories of the field and forest, that mocks, however rudely, the labor of the systematist and cabinet, that invites to hidden secrets in a largely unknown world. The *Wanderings in South America* has doubtless been to many one of the earliest books of travel to inspire, and it has always seemed to me to be the impelling force which through many years has held up the vision of a journey to the great primeval forest of the south. Therefore, to its author *nominatim* I surrender 'a certain portion of the honours' that may come to me from my recent and exceedingly modest journey; for, as he says, 'As Ulysses sent Achilles to Troy, so I sent him to Guiana.'

If Surinam, the close neighbour and parent of British Guiana, can be properly likened, as has been done by Palgrave, to the Biblical paradise simply because it is 'a very pleasant place' and not over-progressive, so, for like reasons, the comparison might be extended to cover the British colony, in which the

moulding of man and his methods sees before it a long future. The similarity, if it does not extend much beyond the two conditions which it specifies, has other elements that may be thought to justify a comparison. A free, untrammelled Nature tends toward *paradisism*, and there are few regions of the earth's surface where the encroaches of man have done less to modify wild nature, or to take from it its majestic solemnity and grandeur, than the wilds that stretch in one almost unbroken sweep from the mouth of the Orinoco to the lower basin of the Amazon. It is here that the great primeval forest, the almost pathless solitude that has made classic the descriptive writings of Humboldt, Von Martius, Schomburgk, Bates, and Wallace, still gathers in its darkness from a region of almost no trespass, and unfolds itself in a magnificence that is perhaps not to be matched elsewhere. The continuous forest of the Amazon-Orinoco basin covers not less than 2,000,000 square miles, and, it may be, considerably more, and in its region of vast trackless woods there is hardly a gateway to the interior, barely a road or path, and virtually no line of travel-communication except where nature has set those water-highways which, even as secondary rivers, pour out their waters in volumes exceeding those of the Volga, the Danube, the Rhine, or even the Mississippi.

Most travellers receive their first impressions of British Guiana on their arrival at the capital city, Georgetown (more commonly designated from the country in which it is situated, Demerara), but before this, and for many miles out to sea, he will have noted a characteristic of the land in the yellow-brown waters that lie outside, the sediment that rolls out in floods or is gathered in from the discharge waters of the Orinoco. The Amazon seems to have little part in this discoloration; for, if my information is correct, much of the off-shore of French Guiana and the land lying still farther to the eastward are bathed by a clear sea. Back of the fringe of muddy water the eye follows the low contour of a bordering grove of mangrove, and beyond it in some places, or replacing it elsewhere, the glass may resolve a somewhat loftier growth of willow-like bushes, or even trees, the courida (*Avicennia nitida*). In the distance, less lofty than the occasional chimney that tells where the sugar-

cane is being grown, or where it was cultivated until competition with the sugar-beet broke the back of the most important, albeit steadily failing, industry of the colony, are a few specimens of the royal and cabbage palms (*Oreodoxa regia, Oreodoxa oleracea*), and the landscape is virtually complete. There is not a rise in the land that even remotely suggests a hill, and it is in faith only that the mind constructs the landscape of lofty mountains in the far interior. Nearing the land, a space of some three-quarters of a mile between the growths on either side invites to where the Demerara River opens out to sea, and on the river, a short distance up the right bank, lies Georgetown.

The capital city does not particularly concern the naturalist, except for its botanic garden and experiment station, its charming avenues of trees, and the open water-ways, the so-called 'canals' of the city, which are magnificently grown with the *Victoria regia* and the equally beautiful large-flowered water-lily and lotus. I had heard much of these open canals, but rarely a word regarding their attractiveness. Residents of the city are habituated to this display of floral wealth, but to the newcomer, to the one who knows these glories of vegetation only from the isolated specimens in botanic gardens, the spectacle is a ravishing one, however closely it may be associated with the prosaic topic of city drainage.

From the moment that the traveller has set foot on Georgetown soil he has made friends with that lovable and seemingly always cheerful laniine bird, the kiskadee (*Pitangus violaceus*). *Qu'est-ce-que-dit?* comes from the tree-tops overhead, from orchards and gardens, and from your hotel window-sill. Throughout all the hours of day and through many of the hours of semi-day this sprightly interlocutor plies his little inquiry, not waiting nor caring for a reply. In that part of town which insensibly removes to country, a more direct call upon the stranger may be made in the quizzical and surprisingly human 'Who-are-you? Who-who-are-you?' of the native whippoorwill — a voice which, when once recognized, brings back pleasant memories of lands far away.

Georgetown is by no means a featureless city, and those who assume that decaying colonies must necessarily have their representation in centres ranking equally with them in decay will

egard with more than respect the stately Government Buildngs, the Law Courts, the market-house, the Club, the numerus large commercial houses — where, repeating a characteristic f many business-houses the world over, everything may be ad from a needle to a church-steeple — and, above all, the nviting tropical houses that lie back in cool and shaded gardens. An effective system of trolley-cars ministers to the wants of a very large part of the 60,000 inhabitants, by far the greater number of whom are blacks, and a smaller number East Indian coolies. The whites, who constitute about three-fourths of the entire white population of the colony, number less than six thousand. Georgetown is in outer dress more attractive than either Bridgetown, in Barbados, or Port-of-Spain, Trinidad, although from the peculiarities of its geographical location it can lay no claim to scenery as part of its composition. Although my visit was timed for the months of March and April, and therefore for the period when the sun was in one of its summer positions and virtually overhead, the highest shade temperature that I saw recorded was only 87.5°, between midday and two o'clock in the afternoon. At this distance, therefore, of only little more than four hundred miles from the equator the extreme temperature was below that which I had observed on the Yukon River, on or near the Arctic Circle. The evenings were invariably delightful, and their refreshing quality made man a willing servant to work on the morrow.

The Exuberance of Animal Life

In the low savannah country that for miles extends backwards from the sea-border, and frequently assumes the garb of flooded meadows in which houses appear like floating arks and where man displays his amphibious instincts in a way to remind one that roadways are not always the determinants of direction in travel, the naturalist is brought face to face with that exuberance in animal life which is the day-dream of tropical nature. Hundreds and thousands of the white ibis fleck the meadows with their slender forms. With them are spoonbills, herons, and bitterns, and myriads of the little reed-bird (*Xanthosomus icterocephalus*) — the whole a bird paradise. The graceful

little spur-wing or jaçana (*Parra jaçana*) is everywhere busy in the grass-copings and sedges, apparently unmindful of the watching eyes of hawks and harriers, which appear to be in every bush and tree. They plume themselves along the drive-ways, or sit gravely on branch or fence-post, taking no notice of the passer-by, no more than the passer-by takes notice of them. This quality of unconcern is charming in its relation to association, and gives an opportunity to the observer to make his investigations at close range. A large-sized manatee was disporting in a pool immediately back of the railroad station at Belfield, where we were waiting for a passing train, and it, too, seemed to be wholly indifferent to the people who happened to be near-by.

The abundance in which the birds were about naturally made one eager for the chance to see the rarer types. While speeding over the savannahs my eye caught sight of three individuals of the great American adjutant or jabirú (*Mycteria Americana*), 'negro-kops' as they are here styled, so peacefully meditating that one might have thought them posed by a photographer. The naked branches of the lofty ceiba or silk-cotton tree everywhere hang with the purse-nests of the *Icterinæ*, twenty to fifty, or more, in number, all gently swaying in the breeze that catches their lofty position. Some of these nests, notably of the *bunya*-birds (*Ostinops decumanus, O. viridis*) measure at times five feet or more in length, and are marvels in delicacy of construction. Storm and rain may come, but the little ones still swing in placid security in their dizzy heights above. The thinking naturalist, despite all theories of birds' nests, must continue to ponder over the evolutionary process that shaped the destinies of these remarkable constructions.

At Buxton, a small hamlet a few miles from Georgetown, where I was for some days serving a most pleasant guestship, there was nailed over the passageway between the verandah and the interior sitting-room of my host's house the skin of a large water-kamudi or anaconda. It measured 20 feet 7 inches in length, and opened out to something more than two feet. It was thus a large animal, and I naturally assumed that it was a trophy obtained from the chase in some deep interior part of the colony. But my host informed me that it met its fate

as a transgressor at a distance of only 150 yards from the house, and that hardly more than a twelvemonth ago. The largest authenticated specimen of the anaconda coming from the colony appears to have measured about 29 feet in length.

On my first walk out from my host's house, a late afternoon family stroll, we chanced upon a specimen of the crab-dog (*Procyon cancrivorus*), which was being pursued in true raccoon-hunt fashion by a horde of negro boys and scatterlings. Poor creature, its broken back did not permit it to make either a vigorous defence or a graceful flight. On the morning following a living specimen of the crab-fox (*Canis cancrivorus*), its feet securely tied together, was deposited 'on sale' on the porch steps. These instances of close neighborship will show how delightfully situated the zoölogist may be who chances to visit this region. He will not lack for material, although it can well be that at times this material may be found too close at hand. Returning early of an evening from a tennis-party, driving homeward, we found the road momentarily blocked by a not entirely ignoble specimen of alligator, whose domain extended to the waters of a bordering canal. It was one of numerous denizens of the water-ways of the region; but of such the inhabitants take little count, and allow them to work out their own salvation. The alligator, as distinguished from the less common cayman, rarely attains a length, as I understand, much exceeding seven or eight feet.

The Mighty Rivers

Lest the geographer become too thoroughly impressed with the notion that the great rivers of the globe are only those that serve as trade-carriers or have played a familiar part in childhood's study of geography, it may be noted that in this distant forest-land are rolling waters that would shame the rivers of Europe — that would put to a long test even the 'Father of American Waters.' The great sweep of the Corentyn and Essequibo, rivers that 60 miles or more above their estuarine mouths measure from three to four miles in width, and which for yet a further hundred miles may still carry two miles, is an object-lesson in geography which impresses with more than

ordinary force. Let the traveller stand at Bartica on the Essequibo, where the waters of the Mazaruni and Cuyuni are mingled in with those of his own stream, and he will no longer wonder why this region is sometimes called in one of its Indian tongues 'the land of many waters.' From far off, like unto the picture which the master of 'Thanatopsis' has given of the Oregon, roll in the waters of these mighty tributaries, threading the mazes of the dark forest that falls to their banks, and leaping in silver sheets of foam through the scarred rocks that here and there interpose as cataract-walls. Nearly all of the major streams of British Guiana are now freely and regularly navigated by small steamboats and launches, but obstructing cataracts do not in most cases permit of continuous navigation for more than 70–125 miles. Above the reach of tumbling waters, nearly all of which are passed downward by paddle-craft, middle-course navigation has been established in some cases, so that without difficulty the traveller may penetrate a far way into the interior. The Corentyn, Berbice, Demerara, Essequibo (with some of its major tributaries), and Barima have all their little passenger craft, and they afford an entrancing way of studying scenery and the general characteristics of the country.

My own main journey was made by way of the Demerara River to Wismar, thence by rail across a line of inner sand-dunes — the ancient sea-beach, still attested by the presence of shells which are identical with those found on the ocean front — largely overgrown with the trumpet-tree (*Cecropia peltata*), to Rockstone on the Essequibo, and from Rockstone (which lies a short distance above the head of a long line of rapids) to within a few miles of the Potaro River. The Demerara, in its course of about 70 miles to Wismar, presents scenery of only a mild type, but a veritable moving picture of life. The vegetation that borders it is rankly tropical, but what there is of woodland or forest is probably wholly of second growth. Great thickets of canna, of the giant-leaved 'muck-a-muck' (*Montrichardia arborescens*), and cane grow out of the river's banks, and with other plants form so dense a fringe to the water that a land-surface is rarely to be seen, not even to a stray rock or pebble. The tier of thicket that rises back of the river-fringe

is a vast conglomeration of green, in which the eye notes here and there clumps of eta (*Mauritia flexuosa*) and suwarri palm, of the more graceful cucurrit and manicole, the grey-barked and nearly naked-branched ceiba, with its swinging nests of cassiques, the lofty (*Mora excelsa*) purple-heart, and a mass of other trees all roped and matted together, and densely shrouded in upper growths of aroids, bromelias, and orchids. Tiny hamlets, some of them only visible in a few scattered houses, in a detached church, or in a country-store bearing the name of Chinese proprietorship, here and there peer out from the canopy of vegetation, or give evidences of existence in growths of bananas and cocoanut. But at all the 'landings,' which with few exceptions are made moving in mid-stream, in the manner of landings on the Rhine, you have plenty of folk — men, women, and children, mostly black or brown — come out to meet you, to gather in what is desired for debarkation at their 'ports,' or to take passage for some farther point on the river. At such meetings a generous flow of language usually acts as a stimulant to what intercourse is provided. The number of native boats that ply on the river is very large, and at nearly all times some of these — whether the simple dug-out or pirogue ('corial') or the banana-leaf sheltered scow and flat-boat — can be picked up along either shore. They transport fruit, dyewoods, baskets, wooden-ware and charcoal, some coming from far inland, others from the tributary waters that discharge under forest archways, so thickly screened by hanging and climbing plants as to be all but lost to the unaccustomed eye.

Throughout nearly the whole of the river-journey individuals of a species of fork-tailed swallow (*Atticora melanoleuca*) would take refuge in a locker under the roof of the steamboat's deck. They came in twos and threes, would stop for a while and then be off again, wholly unmindful of the presence of man. Beyond these creatures there was little of animal life to be seen. Some bitterns and a few steel-blue kingfishers would at times flit across the water, and occasional stray parrots, easily recognized by the rapid, short movement of the wings and their flight in twos, might be observed gambolling among the loftier tree-crowns; but in general it was a quiet nature that prevailed, and there was little to suggest a struggle for existence.

The Forest Primeval of the Essequibo

Just beyond Rockstone, where a line of stately eucalyptus trees leads up to a modest but well-kept hostelry or bungalow built on the edge of the woods, the Essequibo opens out into a superb expanse, with the lofty forest primeval breaking down in curtained walls quite to the river's brink. It is here, where civilization is left behind, that one learns to appreciate what wealth of tropical vegetation really signifies, and how meek and lowly, even if lovingly beautiful, is the vegetation that in the north we ordinarily conceive of as being luxuriant. Little wonder that the botanist Richard Schomburgk wrote in raptured ecstasy his description of this wonderland, that his eyes felt continuously hungry for new marvels of forest creation. Fifty years and more have elapsed since the journey of this naturalist was undertaken, but the wilds of British Guiana, save for the tiny steam craft that move up and down the rivers, puffing out their long lines of smoke, and for a few gold-holes and a few clearings made around gold-prospects, remain the same as they were in the forties — untraversed by paths, uncut, and forbidding, as they will still continue to remain for many years in the future. The sweep of water extends out from one to one and a half miles in width, here and there enclosing islands large and small, but everywhere with virtually unbroken walls of vegetation to mark its limiting borders. There are no longer hamlets or houses, no more clearings or cultivated patches; hardly a boat glides upon the placid surface of the dark waters. The majesty of nature is held up in its half-silent wilderness, in the sea of green that in towering masses teaches a lesson of humility — that tells the inconsequence of man. For a journey of upwards of seventy miles we saw no break in the forest, save where tributary waters come to join the parent stream, parting the wilds now on one side, then on the other.

He is, indeed, a fortunate traveller who can make clear to himself the components of this forest vegetation. We recognize the uplifted crowns of the mora, of the purple-heart and greenheart, here and there the feathery tufts of different palms, occasional fronds of giant tree-ferns, or the buttressed trunks

of the ceiba; but what are these to the vast assemblage of forms that are a secret to all but the professional botanist or that have yet to receive a name? The eye follows wonderingly the long lines of swinging and festooned lianas or bush-ropes, searches the rugged and scarring growths of air-plants that shroud the upper tree-trunks, and then falls upon that wonderful outer tunic, the curtain of creepers, that overgrows all, and, hanging terrace-like from crown to root, keeps to itself the mystery of the interior.

The wall of vegetation maintains a generally uniform height of 125 to 150 feet, with projecting crowns occasionally rising 20–30 feet higher. It is this great height, so difficult at first to realize, which makes the solemn grandeur of the equatorial woodland. The eye fatigues in following the tree-trunks to their lofty terminations, and where it has been finally set at rest it only half sees through the intricacies of foliage that bound its path. The forest, although very densely matted on the absolute water-margin — so much so as to make a footing almost impossible in many parts — is not strictly impenetrable even in the ordinary descriptive sense; for, once away from the water, the barrier of creepers largely disappears, and the undergrowth progressively thins out. But it is only at rare intervals that the machete or cutlass can be dispensed with.

Although the general colour effect of the outer wall of the forest is that of an intense green, there are, nevertheless, many interchanges of brown, russet, and silvery grey — the expression of seasonal change, more or less corresponding to the autumnal changes in our own vegetation, in the foliage of certain groups of plants, I believe for the most part *Leguminosæ;* but there were few trees or bushes that were destitute of leaf-covering — a marked contrast to the 'winter' vegetation which I had before observed on the plains of Yucatan, or to that which I found in the middle of April on the slopes of the outer Andes between La Guaira and Caracas. I was surprised to find here and elsewhere in the forest so few fallen monarchs and generally decaying timbers — a striking contrast to the picture of our own north woods. What became of the trees that had passed their years was not always apparent, but the silent, destructive work of the little termite tells at least a part of the story. They

grind down to powder, and stand as messengers to assimilate the living with the dead.

The average student or reader is apt to picture the tropical wilderness with an aspect wholly different from that of the forest of deciduous trees of the North. Strange forms in foliage are calculated to impress the mind in a particular way, and to give a distinctness to contour which is largely or wholly wanting elsewhere. And, were it possible to unite into one picture the varying and more distinctive patterns which the different groups of plants exhibit, the composite would be truly a picture such as one generally sees in sketches of tropical scenery. Truthfully, too, one may say that such pictures in Nature do exist, as, for example, in the deep valleys of the islands of Dominica or Martinique, where the cannas, the heliconias, the tree-ferns, bamboos, and palms are not only distinctive physiognomic types, but occur in such numbers and in such positions as to make the landscape conformably physiognomic. This is not the case with the forest of Guiana, where the types of vegetation that might be thought to be physiognomic in the broad characters which they present are so far overshadowed by the types that are not particularly distinctive that they lose themselves as determined or dominating figures in the landscape. The palm, for example, which perhaps most people would assume to be the one great distinctive feature of the vegetation of the tropics, is here completely lost, for its tufted crown does not generally rise to more than one-half the height of the great wall of the forest, and even in clumps it is frequently difficult to distinguish. The major part of the woodland, when not too closely scanned or when studied in mass, has an astonishingly northern aspect, the aspect of the woods which are familiar to us in the types of the locust, the laurel, beech, elm, and walnut. This broad resemblance has been clearly pointed out by Im Thurn in his work *Studies among the Indians of British Guiana*, and doubtless has suggested itself to many other observers. When, however, a closer study is made of the components of tropical vegetation, when integrals are examined in place of aggregated masses, the resemblances to northern types, however strong they may yet appear, give way to differences that are far more pronounced in their appeal to the eye. It is in the interior of the

forest that we learn to read the architecture of the vast structure that is about us — to approach with awe the giant buttressed trunks of the mora, the ceiba, the *Eriodendron*, or *Ficus*, to gaze with wondering delight upon the wealth of vegetation that in shrouds, in festooned lines and garlands, form the upper vegetal zone. It is no longer the land of the North, but the land where summer skies are a continuous day. The impressiveness of Nature is here at one with its glories, and man stands and contemplates in silence.

It may not be easy to take the full measure of beauty of a tropical forest; nor indeed, despite its extraordinary wealth of vegetable forms, need it command a higher or more satisfying degree of admiration than the sunlit leafy woods of the North. The forest of the South, rank in growth and illuminated by hardly more than flashes of sunlight, may be thought by many to be oppressive in its grandeur; it is forbidding rather than inviting, for there are no opening glades or vistas of moss-grown retreats, no soft carpets of grass or flowering banks, no receding lines of tree-trunks, to throw dimming shadows into the interior. Everything is grand and majestic, built on a plan to be awe-inspiring rather than pleasing, to evoke admiration rather than to delight.

Mr. Wallace, in his illuminating writings upon 'Tropical Nature,' has laid emphasis, in a contrast between the forest of the South and that of the North — or, indeed, between the vegetation generally of the two sections of the globe — on the marked absence in the former of showy flowers, of that display which we recognize in the glory of a field of clover, or daisy and dandelion, and in the blossoming crowns of the apple, the pear, and the cherry. The traveller, he remarks, may wander for weeks among or about the wilds of the Amazonian solitudes without once having his attention attracted by showy flowers. The wilderness is green, severe, and unrelieved by colour. One cannot absolutely accept this picture, albeit it is framed by one whose years of observation in the equatorial regions entitle him to a degree of consideration which falls to the work of but few naturalists. Mr. Im Thurn, in the work already referred to, has taken distinct exception to Mr. Wallace's characterization, in so far as it relates to the water-front of the Guiana forest.

A display of flowers is here by no means exceptional, and I question if there are many areas of northern woodland which have more, or even as much, to show. One cannot readily forget the patches of blue and purple *Passifloraceæ* which cover in sheets the outer tunic of the forest, the blazes of white and yellow acacias, or the intensely scarlet wheels of the *Rhexia*. These may not be more beautiful or attractive than the exquisite flowers of the rhododendron, the mountain-laurel or dog-wood, but are they much less? The northern woods, in fact, are not in themselves ordinarily prolific in a display of flowers. It is in the open fields and wastelands that we find that floral aggregation for which, I believe, one searches in vain in the tropics.

The Life in the Wilderness

It is, perhaps, a commonplace observation that life is prolific in the southern 'bush.' Yet, be it so or not, there are some who choose to believe that these wilds are impressive in their silence, by that hushed nature which is a part of the Polar tract. The deep forest interior may in places wear this character of desertion and loneliness, but elsewhere it plays true to the world which inhabits it, and resounds in joyous sounds and uproarious tumult. Let the stranger place himself on the borders of the forest at almost any point of the river and he may be certain sooner or later to become party to a woodland chorus for which he will have been but ill prepared. It is the voice of the red-howling monkey that he hears — perhaps that of a single individual, or it may be of a whole troop; but either way it is a voice of no gentle cadence — a roar that yields in little to that of the lion. The forest is seemingly in tumult, ringing with a desolating cry; but presently one hears only echoes, and for a while everything may be quiet. It was my ill-fortune not to see any of these monkeys, or, for that matter, any other form of monkey; although fairly abundant, and seemingly always prepared to lend their voices to the night, they managed to keep out of my way and sight. I am told, on what seems to be reliable authority, that on perfectly still nights the fracas caused by a single individual howler may at times be clearly heard at a distance of three or four miles, or even more.

Alexander von Humboldt, in his essay on the 'Nocturnal Life of Animals,' refers to the fitful roar of the American lion. I did not at any time hear this sound in the southern wilds, although acquainted with it in the North, nor did I once come upon the tracks of the animal. On our launch journey up the Essequibo we had occasion to notice a beautiful specimen of the black jaguar, or Maipuri tiger as it is here called, which was leisurely pacing a sand-pit that the river had thrown up. The animal had come out of the forest, and may have been following a trail of capybaras (*Water-haas*), several individuals of which had but a few moments before come down to the water's edge. This rodent seems to be the favorite food of the 'tiger' in these parts. A large spotted cat, reported to be a jaguar but which may have been an ocelot, visited a mining clearing (where I was staying as a guest), back of the Omai, a few days later, but beyond causing a momentary fright to a few negroes did no damage. The stock had been well guarded. My limited days in the woods did not permit me to become acquainted with more than a few of the animal forms that are represented to be most common in the region about. One of these was an individual of the three-toed sloth or aï (*Bradypus tridactylus*), which had wandered too close to a camp of dredge-builders, and was captured. It was most interesting to watch the antics of this animal. With a face more suggestive of an idiot than of anything else, and the bristling, shaggy coat wrapped about its awkwardly-moving limbs, it presented an aspect so singularly at variance with that of other mammals that one may easily pardon Waterton for having placed the figure of one on his frontispiece bearing the legend 'A Nondescript.' The animal made various efforts to secure his liberty by climbing up posts and tree-trunks, but he was taken away to be cared for in a neighbouring shack. His attempt to grapple a tree-trunk the dimensions of which were much too large for his enveloping arms was ludicrous in the extreme. As in other parts of the South American wilds, the leaves of the trumpet-tree or Cecropia constitute the sloth's principal food.

While the great forests of the North are largely deficient in bird-song, so much so that bird-life might be almost thought to be absent from them, this is in no wise true of the Guiana forest.

The garrulous notes of the parrots and parroquets, the yelping calls of the toucan and aracari, sound from a far way in the lofty tree-tops, so far removed that one fails to recognize the brilliant colours with which these birds are adorned. Of exquisite tone are the resonant notes of the pee-pī-yó (*Lathria cineracea*), one of the numerous family of chatterers (*Ampelidae*). I do not recall a bird-note in any way comparable to that of this remarkable songster. Others are more musical, softer in cadence and melody, more brilliant in scale; but none has that emphasis of sound-volume, that metallic 'parting of the ways,' which distinguishes the pee-pī-yó. It is the most general note of the forest, just as the '*Qu'-est-ce-que-dit?*' is the dominant note of the gardens and streets of the city. I was not fortunate enough to catch up the bell-notes of the white araponga or bell-bird (*Chasmorhynchus carunculatus* or *niveus*), which is said to be a common form in these wilds.

Somewhat toward the evening hour, but at times heard throughout the day, the extraordinary, metallic whirr of the six-o'clock-bee or razor-grinder cannot escape one. The insect flits from bush to bush and seemingly a machine-shop goes along.

It is a noteworthy fact that the insect pests are not noticeably numerous in these forests — at least, they were not so in the parts that I visited. Recalling the account given by Humboldt of the torments that were inflicted by the myriads of mosquitoes along the Cassiquiare River, one could well be pardoned for fully preparing against like torments in the valleys of the Guiana rivers. But the mosquito was found to be almost wholly absent from both the Demerara and Essequibo rivers, and the minor insect plagues were about equally deficient, or, at least, not active. Presumably the large volume of swiftly-flowing waters was not favourable to the development of these plague-breeders, and the traveller was given to enjoy the beauties of Nature unmolested and unsought for blood-tribute. Even the great wasp or marabunta, whose home is more in the city than in the forest, gave no opportunity for complaint.

One of the most interesting facts connected with animal life that was called to my attention concerned a small bat, probably the *Desmodus rufus*, whose blood-sucking habits made caution

both man and beast. I first came across this bat, exceeded in size our own common *Vesperugo*, in Exploration Company's clearing, about two miles Landing, on the Essequibo River. It was there a almost constant visitor to the mule paddock, and, opportunity permitted, it did not hesitate to attack of the animals kept there, and draw their blood persistent were these attacks that it was found as a preventive to them, to have the paddock illumined the night with electric lights, the bright glare from seemingly taken unkindly by the little vampires. The of blood actually drained by the bats themselves is when the work of bleeding has been finished there is w, the nature of the wound being such as to remain a long time. It seems to be a fact that the animals are not for a long time made conscious of the assault, ow far this unconsciousness is due to a pleasant, cool- ation which it is thought the bat imparts to his victim the movement of his membranes I am unable to say. ns and fowl of all kinds are liable to attacks similar to which involve the larger stock, and man himself is by no spared. A coloured boy who was working in the Omai ng had been bitten in the large toe of one of his feet two ee days before my arrival, and he was still limping when de an examination of his foot. He only knew of the inci- on awakening from sleep and discovering a big clot of d in the hammock which he occupied.

The Exploitation of the Interior

With no interior roadways, its vast and virtually trackless rests, and the obstructing rapids that break the navigation of s waters, it is in the colony not considered a matter for surprise hat it should be slow to open up its resources to the world, or hat the inhabitants should barely know what these resources are. The almost boundless resource of timber, in both hard and dye woods, has thus far hardly been touched for export. Lumber concessions, under a wise forestry supervision, there are here and there, but little of the material felled finds its way beyond the

limits of the colony. The most important specific grants are for *balata*, or rubber, forests of which extend across from the Barima to the Mazaruni; but little has been realized thus far from the grants. In its mineral aspects the colony shows a somewhat better record, but yet far from one that need offer a type to other countries. Ever since the days when Raleigh set out in search of the fabled El Dorado, the quest for gold has been an occupation in Guiana, and what little this quest has yielded has been more than sufficient to demonstrate that gold mining may before a distant future become an important industry. Nearly all the gold is obtained from placer deposits, gravels, and clays, or from a complex rock of a granitic or diabasic character which liberates its product on decomposition. Until recently the work of mining was conducted on a rudimentary or losing system, but latterly considerable profits have been taken out from a few of the holdings where modern machinery has been introduced. Large pumping-engines, dredges, and stamps have already found their way into a few spots in the interior, and before long, doubtless, other locations will be similarly provided. Diamonds of an unusually clear water have been obtained from a few localities, but as yet little is known regarding their occurrence. Other valuable minerals, except the commoner kinds, have not heretofore been discovered. It is, however, only the exploration of the future which can give to us their full value.

Highways can and will be built into the interior, the rivers will be opened fully for navigation, and then the naturalist's paradise will gradually be converted into the prosaic commercial *Hinterland*. Until that time we may continue to wonder how it came to pass that a region so easily accessible, so prodigal in the fruits of Nature, should have so largely escaped the attention of the working naturalist."

X

A PAPER ON "THE PROGRESS OF DISCOVERY"

Mr. Heilprin's writings so far referred to by no means exhaust the list. He was an indefatigable contributor to scientific periodicals, and not all of these papers were preserved by him. He had a happy knack of throwing his vast learning into a popular form, when the occasion seemed to demand a lighter treatment than is usual in strictly scientific discussion. A good example is the following, from a paper on "The Progress of Discovery and the Lands of Promise to the Explorer" in the *Bulletin of the Geographical Club of Philadelphia* for December–January, 1894–95:

"Leaving the field of past exploration for that which yet remains to be accomplished, I shall not occupy your time with a recital of all that still remains the task of the explorer. Room for work there is yet in almost every corner of the globe, and it would perhaps be a false distinction to say that the special fields which I desire to emphasize are more important than many others. But at the present moment they appeal to me with particular force, and perhaps because I am a student of natural science as well as of geography, their importance suggests itself to me in a way that might not impress the simple geographer. First in the line — always barring those seemingly impregnable fortresses of the antipodal north and south, the Arctic and Antarctic regions, the interest attaching to the exploration of which is so well known as to require no further emphasizing — I would suggest a thorough exploration of the Inter-Continental tract which on the North Pacific unites North America with Asia — the Aleutian Islands and Peninsula, the Behring Sea and Strait, and the Peninsula of Kamtchatka. Where two continents approach one another so closely and give evidence of having been

united at seemingly no very ancient date; where a connecting land-bridge could not but most effectually influence the distribution of life, human, animal, and vegetable, upon two hemispheres — there, manifestly, the harvest of exploration must be great, for bound in with the research are problems of deep significance, touching alike the sciences of geology or physical geography, ethnology, geology and botany. We ask ourselves the questions: If North America and Asia were united, when and how did the separation take place? What heterostatic condition existing between the land and the water permitted of the incursion of the sea or the dropping of the land? To what extent was the union complete, and what were the initiatory steps that prefaced the fall? What were the nature and extent of the animal and vegetable migrations of which the connecting land-mass permitted, and which way did they influence the present distribution of life upon the globe? In what way was the distribution of races effected or determined by that connecting bridge? Plainly enough the breadth of these questions indicates how vast is the field that is to be covered by the answer; and while it may be difficult to obtain these answers, they are surely locked up with the rocks that form the continental borderlands, the islands that dot the sea, and the submerged bottom-land of the ocean. And when they will have been obtained they will constitute some of the worthiest contributions to geographical science the records of which adorn the pages of discovery. It is almost incredible that with so much promise in the exploration of this region so little should have been accomplished. Easy of access, and well within the resource of a moderately-equipped expedition, the region should long since have attracted to it an army of scientists, but for the moment Dr. George Dawson is almost the only one who has contributed to our knowledge on the lines of the inquiry which I have outlined. Unfortunately, as a member of the Behring Sea Commission, his explorations were largely controlled by matters of national import, and were not permitted that scope which the interests of science demand. Yet the simple discovery by him of a mammoth tooth on one of the outlying islands is in itself an index pointing hard-by to the history that is still to be read in the broken fragments of the northern waters.

The second region to which I should direct exploration is West Central Africa — the region of the equatorial forests, whose sombre depths, perhaps shaded by many of the same trees which already threw out their arms in the days of Herodotus, still await the traveller of the pattern of Emin, Holub and Schweinfurth, to whom exploration meant not merely the following and plotting of river-courses, the determination of astronomical positions and the laying of a route, but the close investigation of all nature, from its rocks, and plants, and animals to man and the atmosphere. For such a one this region is as yet a world unconquered.

The line of investigation which I should here specially recommend is one looking to the history of man and his nearest associates, the anthropoid apes, for after all the history of ourselves appeals with more force to almost every form of intellect than probably any other inquiry. And I specially emphasize in this connection the West African region because I believe that there, under competent search, will be revealed some of the most interesting, if not the most ancient records that pertain to hominine history. For we cannot lose sight of the fact, that in whatever manner we may view the evolutionary doctrine so far as the direct ancestors of man are concerned, his nearest analogues are the great apes of this region, and from their habits and customs much can be learned. But I wish specially to emphasize the necessity for searching for their predecessors; the rocks of the region, so far as our knowledge is concerned, are yet silent on this point, but remain silent only because no real effort has been made to search their records. It has been the fashion of late years for geologists and naturalists to consider the African fauna as an importation from Europe — the element of the northern continent driven south by the cold of the Glacial epoch, and crossing over into the southern continent at a time when one or more land-bridges spanned what is now the Mediterranean. There is much to support this view, perhaps equally much that is against it, but in whatever way the evidence lies it never will be complete until the rocks of Africa are searched for possible ancestors or progenitors of the existing fauna. Until they are discovered, or their existence virtually disproved, the question of origination will be an open one, and in so far will the history

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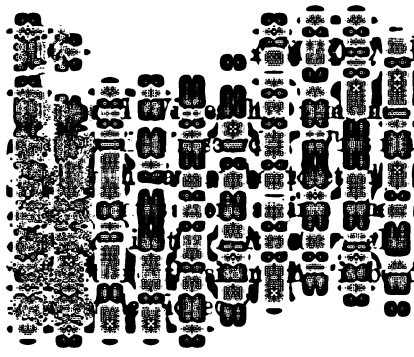
supply the terrestrial or oceanic configuration which meets these conditions. The Bermuda Islands offer a specially desirable field for this form of inquiry. Distant upwards of 600 miles from the nearest shore line — with the exception of the Sandwich Islands the most distinctively oceanic of all oceanic islands — and so far as is known independent in their existence of all volcanic associations, they seem particularly adapted to throw light on the problem of past changes in the land and water areas of the globe. A boring of a few hundred feet — possibly even a single hundred — would determine the substratum of the islands, and inform us whether we are dealing with a simple oceanic volcano, or with the submerged summits of a mountain axis whose base is implanted upon the oceanic floor. If the latter should prove to be the case, then after all we may not be far removed from the gates of the veritable Atlantis. Many facts in geology and in the distribution of animal life to-day favor the view of a comparatively recent (geologically speaking) land-mass connecting Western Africa with the ancient Spanish Main, and it would certainly be interesting to throw additional light upon this subject from the side of geography. The investment of a few thousand dollars could not be more profitably placed than in the effort to determine what is within the land that is covered by the sea.

A fourth field of exploration, which holds out rich reward to the all-round investigator, is the extreme south of the South American continent and the islands and land-mass that more or less project it in the direction of the Antarctic continent. In the exploration of this region we open up much the same problems as those that are presented by the North-Pacific — namely, the problems of continental relationships and breakages. What is the relationship of South America with the Antarctic continent? Whence has it obtained its fauna and flora? Who are the far southern people? These are but a few of the questions to which neither the geographer nor the scientist is ashamed to receive an answer. It is gratifying to be able to state in this connection that, in England at least, the revival of Antarctic exploration is being warmly agitated, and unless the signs entirely fail us, we may expect before long a well-equipped expedition to the region which for a half century, or since the days of Sir James Clark



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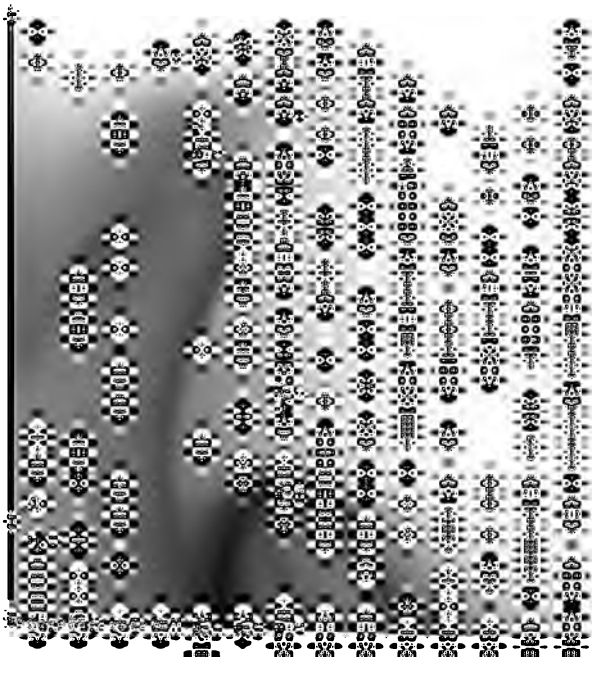

XI

HEILPRIN'S RECOLLECTIONS OF HUXLEY

In the *Popular Science Monthly*, for January, 1896, appeared Mr. Heilprin's interesting paper, "A Student's Recollections of Huxley":

"It was my pleasant fortune, a few years back, to have my name enrolled with a limited few in the registry book of the Royal School of Mines in London, destined for work at one of the ten or twelve tables which covered the greater part of the ground space of Professor Huxley's laboratory. The building was a comparatively new one, having been erected as an adjunct to the new South Kensington Museum on Exhibition Road, and from the top floor looked out the various rooms in which we were to receive our tutorage from the great naturalist. A climbing flight of stone steps, with landings, wound round to this summit, to which at times of irregular journey also conducted a box 'lift.' On one of my daily upward saunterings I chanced to stumble upon my master, who, always a rapid walker, overtook me on the grand 'round,' and cordially greeted me as a fellow-traveller. Possibly I allowed myself a little to be overtaken, for, though I had already been in the workshop and lecture theater a number of days, and had answered questions on *Torula*, *Paramœcium*, and other low grades of organisms, and had even swallowed a good-natured rebuke for attempting to use a compound binocular in place of the simple, and confessedly clumsy, microscopes which were furnished gratuitously to the students, the opportunity to meet the man as man and not as teacher had not yet presented itself. Professor Huxley's private rooms almost adjoined the laboratory, and frequently on passing the

door the temptation grew strong upon me to knock and allow myself the honor of an interview, but each time a certain Tootsian timidity overcame me, and directed my course either to the right or to the left. The meeting on the landing was thus a deliverance, and Huxley allowed me to make the most of it by himself opening the conversation. It began with a reference to the deficiencies in modern building construction, particularly applied to the South Kensington annex, and evoked by the absence of proper mounting appliances. 'Our lifts are not like the grand elevators in your country,' remarked the professor — a thought in which it was not difficult to concur.

This first bit of extra-class conversation impressed itself forcibly upon my mind, both for the pleasure that it gave me and the surprise it occasioned in the knowledge that I was from American soil. No reference to foreign studentship had heretofore been made, and I was a little puzzled to know what kind of information had led to the betrayal of my personality. Considerably later I learned that a close friend of my father's, the late Professor Youmans — himself a friend equally to science and to the scientific student — had addressed a personal note to Professor Huxley, advising him of my presence and commending me in the usual way to a kind consideration and to an equally considerate esteem. It was characteristic of the justness and fairness of the master that this letter, while it may have paved the way to a more informal acquaintance outside of the class room, in no way influenced favoritism within, or saved me from sound criticism of my work when it merited it. This was not exactly at long intervals, and particularly do I recall the painful awaiting of judgment on a mangled dissection of the nerves of the frog. 'Your blue papers are where the red should be, and the sympathetic is gone' — a piece of information the basis of a portion of which had already only too keenly been realized.

At no time was criticism given in a way to hurt, and more commonly encouragement and commendation took the place of criticism. But a thing had to be really well done to call out praise, and an exuberance of it rarely broke an echo from the laboratory walls. On one occasion I was startled by the inquiry if my drawing — a drawing of the division lines in the cells of a certain water plant — was made from the object or from im-

agination, an inquiry which threw doubt in my mind as to whether I was receiving praise or condemnation. The representation was considered unusually true to Nature, but I was forced to admit that it was a combined product of the visual and mental eye, and not a mere transcript of Nature. This explanation was in no way a satisfaction to Professor Huxley, who took the opportunity to admonish the class that drawings, however true they may appear to Nature, are only true when they strictly copy the objects which they are intended to portray.

Huxley himself was an excellent draughtsman, and it was frequently remarked of him, as it was also of our own Dr. Leidy, that had he devoted himself to painting, instead of to science, he would have forced himself to a position not less prominent as an artist than that which he occupied as a naturalist. He was always precise in his drawings on the blackboard, and if he could not, perhaps, like Professor Weisbach, of Freiberg, jump to a circle and punch its middle point with a stub of chalk, he could, apparently without any hesitancy, draw the most complex anatomical constructions, and in such a way as to make every point clearly intelligible to the student. It was probably from the father's side that Mrs. Thomas Collier, *née* Huxley, who had well earned her several premiums from the fine-art institutions of London, inherited her tendencies and capabilities in the direction of painting. Inspired in a measure, probably, through his love for art, and with an inborn feeling for mechanical constructions, Professor Huxley always held a kindly sympathy for all that pertained to the science of engineering; and he frequently expressed the thought, which will doubtless seem strange to many, that he had missed his vocation, and that the true field of his activities should have been the field of an engineer. Yet it is singular that with this proclivity for a branch of study which requires for its successful accomplishment a generous supply of mathematical stimulus, the fact that he was in no way a mathematician did not terrify Huxley. He frequently admitted that he had neither a liking nor an aptitude for figures, and it was a timely forethought in lecturing, when a condition required a mathematical calculation for its elucidation, to have the answer written in advance at one corner of the board. This, as was naïvely explained by the lecturer, was to

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and Sir Wyville Thomson, Huxley, contrary to previous agreement, was also called upon for a few words, and with the pleasing introduction (as nearly as I can now recall the passage), 'There is one among us whom, by reason of his witty tongue and ever-readiness, it is a pleasure to call upon.'

Following the applause which greeted his name — the mention of which was unmistakably a disagreeable surprise to the one more particularly concerned — Huxley took occasion to explain in emphatic language that were it only generally known how much of an effort it cost him to speak, his friends would willingly allow him more peace, and save the lingering wreck of his bodily frame. This admission — which was followed by a short but most happy *ex-tempore* utterance — appeared to me so strange that I was determined on the first proper occasion to obtain at first hand its true meaning. The opportunity presented itself a few days later, immediately after the conclusion of a stirring public address (read from manuscript) on 'Sunday Opening,' if by this name we may designate the liberty of displaying and using on the Sabbath-day collections of books and paintings, museum and other treasures, and of listening to scientific discourses. Dean Stanley and one or two other speakers had preceded him, but manifestly the audience was waiting for the speaker of the occasion. A more brilliant and incisive arraignment of those who by legal process attempted to forever remove from the workingman his one day of self-improvement could hardly have been formulated, and the speaker was greeted with vociferous applause. Meeting him on the way homeward from the lecture hall, I asked for a significance of the explanation made a few evenings before at the dinner table, for it did not seem possible to me that one gifted with such fluent powers of speech, and backed by an almost unfathomable fund of knowledge, could feel any fear or hesitancy in speaking, no matter what the occasion. In his answer, Professor Huxley repeated in substance what he had before said, only more clearly emphasizing the nervous fear with which he mounted the platform. He then assured me that he might have saved himself an African journey, undertaken for health recuperation, had he abstained from public deliverances.

It has been frequently assumed that Huxley cared for little

beyond science, and especially for that side of it which was combative either with the Church or with the State, but nothing could be further from the truth than the belief that this was in fact the case. It is perfectly true that Huxley used all the vigor of speech of which he was capable to emphasize what he considered to be the proper position of science in any education, and perhaps he even considered the acquisition of scientific knowledge to be of more importance than any other form of learning, but he was always careful to emphasize that education was only such when it was broad and comprehensive, when it comprised not only science, but in addition a goodly share of the world's history and literature. His own resource in the fields of literature (English, French, German, and Italian) and history was prodigious, and he rarely was at a loss to instantly take advantage of a citation from some early scholar to demolish at first or second hand an adversary at arms. When I was in London he was reading, with the assistance of a friend, Russian, and mainly for the purpose of fully familiarizing himself with the work of the great anatomist, A. Kovalevski, whose writings he was seemingly the first to bring to the critical notice of English-speaking naturalists. It was this thorough familiarity with what one is almost tempted to call universal knowledge that made Professor Huxley such a dreaded foe to his enemies, and it has well been remarked, 'Woe be to him who attempts to measure arms with such an antagonist!'

Huxley was a firm believer in thorough knowledge, and he took no stock in brain-stuffing; to have known a thing once, and to be able to put your hand upon it when you again want it, was his maxim. The opening address delivered by him before the Johns Hopkins University, in 1876, gives the keynote to his position in the matter of special training. 'Know a thing directly,' he often remarked, 'and do not assume that you know more of it by knowing *around* it.' He had no patience with those who spoke with a pseudo-authority begotten of chance, and was bitter in his denunciation of officialism as affording a pretext for either defending or attacking scientific dogma. An interesting anecdote, which Professor Huxley himself related to me, shows the occasional happy frame of mind in which our *savant* found himself when he, in turn, was re-

ceiving blows. A prominent bishop of the English Church, whose name it is not here necessary to mention, had been for some time endeavoring to smash the Darwinian hypothesis through some actual researches in zoölogy which he claimed to have undertaken. Toward the accomplishment of this laudable effort he used many pages of the current magazines and equally many columns of the daily press, in each of which the 'under-nurse of Darwinism' came in for an uncommonly large share of ridicule. Finding that none of these papers brought forth any comment from Professor Huxley, their author in a personal letter called his attention to them, at the same time asking to be advised as to what particular course of reading would most readily enable him to grapple with the various scientific questions which at that time agitated the world. Professor Huxley's full and laconic answer was, 'Take a cockroach and dissect it.' No further inquiry came from that source.

I once found Professor Huxley much depressed over a small paragraph which also touched, and in a very depreciatory manner, the evolutionary hypothesis, which had been contributed to the daily press by his friend Carlyle. He greatly deplored the recklessness of the utterances contained in the squib, and especially painful to him was a markedly undignified reference to the one man for whom Huxley had a greater reverence than for any other — Charles Darwin. To my interrogatory as to whether he considered it necessary to reply to the paragraph, he promptly and emphatically answered, No!

Remorseless as Huxley occasionally was in the cold exposition of the blunders of his colaborers in science, he was usually very lenient to those who pointed out his own mistakes. I remember one occasion when a post-graduate student of the Royal School of Mines, Patrick (now Professor) Geddes, intimated to the professor that his interpretation of the mechanism of the radula in the common garden snail, as was set forth in the 'Anatomy of Invertebrated Animals,' was not supported by the newer laboratory dissections. Professor Huxley's response was a request of Mr. Geddes to try a new dissection; it was done, and it was found that the pupil was right and the master wrong. Only once do I recall when a correction was received with a regret almost akin to displeasure — the case of the *Bathybius*,

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His powerful bodily frame,
ough a generous development

of tissue about the equatorial region, was in marked contrast to the tall and nearly upright carriage of Professor Huxley, whose slightly stooping head and shoulders reduced somewhat what might otherwise have been considered a more than average height. Huxley never entered the class lecture room except in a dress in which he was immediately prepared to go to the street; Vogt rarely appeared without a coat which did not in one or more places show visible signs of underlying shirt sleeves. The presence of women in no way affected his *Wohlgefühl,* and in truth it must be said that this class of students was to him in a measure a blank, as he invariably addressed the class only as '*Messieurs.*'

Among the many warm friends and admirers that Huxley numbered within the ranks of the scientific fraternity there was none who was more enthusiastic in his admiration of the great man than the distinguished comparative anatomist of the Royal College of Surgeons, the late Professor Kitchen Parker. An afternoon and evening spent at the home of this most genial and all-overflowing host serves my memory as the record of one of the pleasantest incidents of my student life in London. Huxley and Parker had not many years before announced their new classification of birds — worked out conjointly on characters founded principally on the position and construction of the bones of the palate and beak — and the stir which that radical departure in classification brought out had not yet subsided. Professor Parker was still largely engaged in proving his case, and was naturally, to use an expression that is less elegant than determining, full of it. The overjoyful manner in which he pointed out a confirmatory character here and there, or an exception to the rule elsewhere, kindled a glowing enthusiasm within the listener to follow in the line of the master, and a desire to make immediate friends with basi-sphenoid and pterygoid bones. Drawer after drawer of neatly prepared bird skulls, colored in correspondence so that identical or homologous parts could be immediately detected, were pulled out and hastily scanned over; but the explanations that were given, whatever they might have been, were liberally sprinkled with admiration for the genius of Huxley — who first broke into the method which Parker so successfully elaborated — a second to whom

was not to be found in all Britain. I shall not easily forget the ocular gleam of pleasure, perhaps even delight, with which Professor Parker announced dissent on certain anatomical points from the opinions of his friend and colaborer. The following very graceful tribute to the clearness of Professor Huxley's expositions appears in this author's article on Birds, contributed to the ninth edition of the Encyclopædia Britannica (page 717): 'The writer will often use the very words of Professor Huxley, despairing as he does of coming near that excellent writer either in condensation or order.'

Huxley, as is well known, was a master hand in the construction of the English language. For elegance and force of diction he had no superior — perhaps not even an equal — among the writers of his day, and there are few purely literary men whose productions maintain so uniformly a high quality of excellence. In borrowing from the decorative side of language, he never allowed the embellishment of phrases to interfere with the clear statement of what he had to convey either by word of mouth or of pen, or to in any way cloud his meaning. Friends and foes thus knew his position precisely, and he was always taken on his own recognizance. A strict adherence to the sequence of truth, fact, and a logical deduction from facts, was his maxim, and it was this that assured his ground for battle, and carried him triumphantly through nearly all his combats. As has before been remarked, Huxley took little stock in brain-stuffing, yet it can in no way be complained of that his own brain was 'of the empty kind.' The range of topics that his conversation touched was almost bewildering, yet so discreetly was his knowledge dispensed that oftentimes one assumed that he was making an inquiry, when, in fact, he was giving the answer to it. Well do I recall a meeting on Brompton Road when the conversation almost immediately turned upon American racing and race horses, a topic on which I was obliged to confess myself an absolute ignoramus by the side of my interlocutor.

A few parting words. In 1893 I had the pleasure of being constituted one of a committee of five on the award of the Hayden Memorial Medal of the Academy of Natural Sciences of Philadelphia — a medal (and accompanying fund) awarded for meritorious work in the domain of geology and palæontology.

The award was made unanimously, and almost without discussion, to Professor Huxley, and his name thus appears in association with the names of James Hall, Cope, Suess (of Vienna), and Daubrée (of Paris), other recipients and masters in a field with which the labors of Professor Huxley are not very generally associated. The following characteristic reply, acknowledging the receipt of the award, was addressed to the Academy.

GENTLEMEN: The Hayden Memorial Medal, with your draft (which will incorporate itself into an ornament for my wife's drawing room), reached me the first of the month, a New-Year's gift of a value quite unexampled in my experience. I am very sensible of the great honor which the Academy of Natural Sciences of Philadelphia has conferred upon me — a retired veteran who has much reason to suspect that he has already received quite as much promotion as he has deserved.

But increasing years, if they bring a diminution of variety (I am not sure they do), leave the desire for the esteem of those who have a right to judge us intact, perhaps intensify it; and I beg leave to assure you and your colleagues — fellow-workers of Hayden and Leidy — that the kindly and sympathetic terms of your award have given me very great pleasure.

With all respect, I have the honor to be, gentlemen,

Your obedient servant and colleague,

THOMAS HENRY HUXLEY.

It is not for the student to sum up either the quality or the quantity of the labors of his teacher and master, but for those who still doubt — and there are some such — the justice of the position which has by almost common consent been given to Huxley in the realm of science, it may be recommended as a healthy exercise to carefully read the titles of the hundreds of papers with which this indefatigable writer, for the better part of half a century, has crowded the pages of scientific journals and popular magazines; and after that, with equal care, the inquirer into fame will take an advantageous turn in mastering the papers to which these titles relate. Huxley was great not because he correctly deciphered the history of a fossil bone, not because he

probed deep into the anatomical or physiological mysteries of the living world, nor yet for the reason that he was well-nigh the first — one might say, indeed, the first — to pound the truths and consequences of evolution into the material world, but because in addition to these accomplishments, and much more, he molded the tendencies of modern thought, and to a greater extent than any scientist of his generation with the exception of Charles Darwin. Well could this great philosopher observe that, had it not been for Huxley, the acceptance of the evolutionary hypothesis would have been removed from us by probably at least a generation."

XII

A PROPOSED INTERNATIONAL UNIVERSITY

A subject which at various times engaged Mr. Heilprin's serious attention was treated by him in the following paper in *The Forum* of March, 1900. It was entitled "The Ignorance of Education and the Project of an International University."

"The question as to what ought to constitute the 'higher' education of a tolerant civilization will probably for all time be debated and considered a debatable one. Waves of reform in studies will rise and fall, and each generation is likely to witness some marked improvement or advance upon the systems that were in vogue with the suffering students of the generation before. Methods and studies 'new' are launched by pedagogues the world over upon the sea of education, just as new dresses are flung upon the manikins of fashion to redeem the crudities of the style that has just passed. Systems of literary reading, cyclopædias of best thought, are hurled at the hungry public, just as the multiplication table used to be flung at the complaisant lad of the time when the 'new arithmetic' was still an unknown quantity. The processes of analytic determination have crowded out those of the receptive faculty, and we pride ourselves on the knowing of the whyfore and wherefore of everything. Verily, it might be said that we stand on the threshold of all knowledge, and that the sphinx of silence has become only a relic of ancient history.

Has it in truth come to this? Is the present generation so much wiser as the result of its scholastic training that it can afford to look back upon that which preceded with the feeling that the present has buried the past, and that compassion only need be written over the tombstone?

From time to time a protest is heard to this declaration in

the feeling that the university man, judged at least in a scale of comparative efficiency, is unfitted to execute many of the charges which the ordinary walks of life entail upon mankind; that his mind, instead of remaining free for thought, is crabbed with a method that has been forced upon it; and that the facts with which it has been stored are those which bring remuneration neither to body nor to soul. However much one may feel disposed to set aside such an allegation, every honest educator will admit to himself that there is something of truth in the criticism, and perhaps even more than he may feel disposed to confess. A feeling of unrest seizes upon him with each new disclosure of disqualification, or that which is asserted to be such, and he racks his brain in order to discover what new weapon of defence might be evolved from the pedagogical acorn. It is this that has made the words 'pedagogics' and 'pedagogical' such tyrants in the language of to-day, and has made them powerful with the all-circular educational conventions and the self-satisfying 'teachers' institutes.' With the public at large they are less popular, and to some, it must be confessed, their deliverance brings a feeling almost akin to nausea.

When one seeks to ascertain the value or non-value of the university education, such as we now recognize it, more particularly in this country, it is not sufficient to bring forward the strength of the learning that has been acquired, nor the diversity of topic that has been reached; for the calculation of deficiencies is a more nearly satisfying measure of the service that has been put into three or four years of the best period of academic life. In this connection, it may be recommended as a healthful exercise for the student of the class of 1898–1899 to ascertain for himself to what extent he may have been familiar, historically, geographically, linguistically, and from the side of nature, with the regions of the earth's surface which have latterly engaged the attention of more than one of the great nations of the globe — Cuba, the Philippines, Puerto Rico, the Transvaal, and the northwest of the North American continent. It is claimed, that Java was ceded to the Dutch, in 1816, because England's Minister of Foreign Affairs could not locate the island on the map; and in nearly the same way it may be said that a nation of 75,000,000 inhabitants

plunged into war with a distant land and people, concerning which an ignorance prevailed that was as astonishing as the blunders to which it gave rise were distressing. And this ignorance permeated not alone the 'classes,' but all the departments which make up the active machinery of the national government.

And yet, the Philippines are neither a desert nor a mere oasis of the Pacific; their population being perhaps not far from one-seventh of that of the entire United States, and nearly equal to that of Mexico. At about the period of the outbreak of hostilities Manila, the chief port and capital, had a population of perhaps 250,000 souls, or somewhat more than that of Genoa; and its commerce, calculated for both exports and imports, played no unimportant rôle in the economic relations of the globe. It is probably not overstepping the mark to say that at the beginning of 1898 not five university students out of a thousand could have given any information regarding these islands which might have been considered worth knowing. And though the government of a nation, which has implanted upon its free soil not less than a hundred universities or higher colleges, may have found it necessary to dispatch special commissioners to 'study up' the region, and to dispel in part the obscurity that surrounded it, it must not be assumed that there had not been made up to that time any detailed study of those islands, or that the literature pertaining to them was inaccessible. But it had not yet reached the centres of our institutions of learning.

With the invasion of Cuba we had an army — if we are fully to credit the reports of the commanding officers — entering into the 'wilds' of a near-by land with maps hardly better than those of the crudest atlases, to assist in the work of military exploration; and the maps furnished to the navy appear to have been but little better. This is surpassing strange when it is recalled that Cuba lies just off the United States, and frequently, during the last thirty years, has given rise to disquieting rumors as to a possible engulfment by the United States.

This ignorance of matters geographical, except as coming back in the form of a disagreeable personal humiliation, is hardly surprising to the non-university observer; for he has long since recognized that our higher institutions of learning

stand above the plane of geographical teaching. It is true that from time to time we scan from publishers' lists the advent of some geography to which the educating author has affixed the word 'new'; and the hope is entertained that the 'new geography' will finally supply a long-felt want. But it takes little examination of these works to show that their newness is largely of the bald and ancient type; and the study of geography, where there is such a study at all, continues in our schools and colleges as geography with geography left out, running closely parallel in its method with the study of history. It may be seriously questioned if there are three institutions of academic learning in the entire United States where, at the present time, sound geographical information can be obtained covering the countries to which reference has been made, or where thought is expended upon the political or ethnographic relations existing there.

Of all the lapses in our university training perhaps none is so glaring as that which touches just this 'earth knowledge,' or, as it is more happily expressed by the German, 'Erdkunde.' We learn sufficiently of Greek, but know nothing of Greece, either ancient or modern; we may acquire something of French and German, or even master these languages, and yet know practically nothing of either France or Germany, no more than our study of Oriental languages teaches us of the East. It is only with the outbreak of a sudden movement that we begin to 'brush up'; and it has frequently been remarked that wars afford a providential means of acquiring geographical knowledge.

How the German geographical and historical method contrasts with this appears from a review of the educational process which has recently been published in Petermann's *Mitteilungen*. At not less than forty German and Austrian universities and higher academies the study of countries and peoples is given an uppermost place in the curriculum of education. At the University of Berlin alone there are not less than fifteen chairs or courses of ethno-geographical teaching, not including here the more strictly defined courses in geology and physical geography; and the Seminary for Oriental Languages, in the same city, furnishes for the winter semester of 1899–

1900 ten courses in the study of the geography, history, and ethnology of modern Greece, Syria, Persia, China, Japan, eastern and western Africa, and the Sudan. Much the same diversity and breadth of subject are found in the teachings of the Universities of Leipsic and Vienna; and it is extraordinary what a wealth of subject is outlined by the professors even of the minor universities for their courses of the coming year.

Not many years ago our War Department admitted that much the best general maps of the United States were those to be found in the German atlases. But enormous strides have been made in the official maps of our country during the last few years, causing them to compare favorably in accuracy of detail and execution with nearly the best of their kind issued elsewhere. No bettter way of satisfying one's self with regard to the amplitude and exactness of the German geographical treatment of a country can be had than by examining the 'Baedeker' for the United States, and by comparing the detail, cartographical and descriptive, which appears in that publication (of the Adirondacks, of the Yellowstone and Yosemite, or of the different cities, for example) with similar work in corresponding American or English publications.

Special stress has here been laid upon the deficiencies of this particular branch of learning, because, everywhere, they glaringly stare us in the face. Millions of square miles of the inhabited earth's surface are as unknown to the average university graduate as is the bottom of the sea or the top of the atmosphere; and tens of millions of the earth's inhabitants enjoy an obscurity in the cerebral whirl as complete as that which marks the conception of sky-scrapers and railroads in the brain of the Eskimo. But it is not alone here that we are sadly deficient. Into the domain of science, to which so much attention is properly given at this time, we carry a misguided method which is most distressing in its results. We, or at least many of us, may be proficient in the dissection of a cockroach or mussel, know the ganglia in the sympathetic system of a rabbit, and even talk understandingly of the relations of blastoderm, gastrula, and hypoderm. But much the larger proportion of those who bear diplomas fail to recognize even the commonest of the birds of the field either by song or form; and as to the habits and life

of animals generally, the common knowledge is of such a nature that it might almost as well be dispensed with altogether. Our botanical laboratories teach us properly of sap-circulation and embryo; and under the microtome we bring plant tissue to nearly its finite particle, so far as study is concerned. But it is safe to say that much the larger number of those who leave their *alma mater* equipped for the higher life cannot in the field distinguish between a birch and a poplar, or between a spruce and a pine.

We study minutely the details of 'world' history, follow the fortunes of commanders of a thousand or two thousand years ago to the year and month, and in some cases almost to the day, and treasure up the episodes of war and conquest with a nicety that is almost touching in its tenderness; but the works of the masters of art, whether of painting, sculpture, architecture, music, or the drama, whose refining or vivifying influence is so directly exerted upon mankind, find but the scantiest foothold in our repertoire of collegiate studies. In this regard, indeed, many of the private schools and seminaries far outdo the more potent institutions of higher learning. The pleasure to life that could readily be given to hundreds of thousands by a systematic course in drawing and painting, not to mention the direct practical benefits, is forfeited to the advantage of other studies which neither truly interest nor inspire, and whose benefits (if there are such) are dissipated within the first few weeks after graduation.

All these deficiencies may, indeed, be considered trivial by those who hold that the higher education should take no cognizance of the commonplace and the material; but the scholar, however well he may be equipped with a knowledge of Greek and Latin roots, with the formulas of the Rig Veda, and with psychological inductions, who is suddenly confronted in the field with growths of oats and rye, and cannot distinguish between them, or who does not know even in minutest degree the conditions governing farming or agriculture, is hardly in a way to excite enthusiasm for study among the multitude, who constitute the rural population of every country. 'Reuben' from the country is hardly more of a 'jay' in the city than is the average college graduate a 'jake' in the country.

One can readily anticipate the part-answer that might be made to the criticisms which have here been advanced; namely, that the university affords the opportunity for the study of the branches in which a deficiency has been remarked. It is not, however, a question as to what it offers, but of what it gives to the vast majority of students, and what the students take from it. In its present state, with tendencies clinging to it from a remote past, it is inchoate in both form and substance. What it will be in the future it is impossible to predicate; but that it could be readily improved in its humanizing, directing, and practical tendencies, and give more of a knowledge that is worth having than what it now gives, is as certain as that the sun will set.

At a time when so much effort is expended looking to the betterment of present educational institutions, it may perhaps not be amiss to force an example, and to abjure almost *in toto* the system that has so long dominated the university. The first essential of an education is to know something; the second is to know the most of that which is most worth knowing. The problem is, then, how to acquire the most. The fact, however agreeably or disagreeably received, has long been recognized, that personal contact and practical demonstration or experimentation are to most students much the safest road to the acquiring of knowledge; and the proposition of contact-study, except as a purely theoretical conception, calls for no further discussion. Only the question of how the greatest amount of contact can be established requires particular consideration.

The suggestion is here thrown out that a university, instead of retaining its simple national character, be converted into one with international characteristics; the coöperation of different nations being invited to secure the furtherance of this end. There seems to be no particular reason why a three or four years' course should be tempered exclusively by the atmosphere of a single city or country. No one will question that the same period of time judiciously applied to study in different countries, and with studies standing in the main in direct relation to the environment, must produce results of a much more substantial and lasting character than those with which we have been so long familiar as the outcome of the present system.

Eight months' study in Germany of the German language, of the country and people at large, of German literature, history, art, and manufactures, followed by a similar course, whether of greater or less length, in France, England, Italy, Switzerland, cannot fail to be decisive in at least many of its aspects. And, in the end, the student, let him be ever so stupid or perverse, must acquire something to which he can look with real advantage. Rome studied from the Forum is very different from Rome studied from class-books, just as widely separated as would be the study of modern France in the monuments of Paris from written history, or that of the living glacier of Switzerland or the active volcano about Naples from the text furnished by geological text-books. A little of real Russia is worth a ton of theoretical Russia, and much more than that amount of many other studies which to-day so largely engross the time of the university student and lead to practically nothing. Moreover, the advantage of studying under wholly different masters presents itself as an obvious proposition.

It is not the purpose of this article to outline a course of international university training, or to indicate the methods by which it might be most readily brought about. It is enough to know that such a project lies well within the zone of practicability, and is already narrowly anticipated in the 'travelling' system which attains with the German universities. A prearranged system of main studies for the different countries, designed also to include a certain number of studies as are not distinctly geographical or historical in their relations, can easily be formulated, and made equally applicable to students of all nations. Few, then, of the general branches would remain over for a 'finishing' year at the home college, or for that period of time which may be considered necessary to compass them.

It may be objected that the plan here outlined contemplates personal expenditure far beyond what is now incurred at the different seats of learning at home, and that in a prohibitory aspect it might act rather as a deterrent than as an incentive to the acquiring of knowledge. What this excess of expenditure may amount to cannot easily be calculated to a narrow margin; but it would probably not be such as to overreach the capacities of most university students. And it may be taken for certain

that the courses need not be made more costly than the courses at some of the university centres to-day. A judiciously conducted study-course of two years following both banks of the Mediterranean would be worth much more to most students than any combination of four years that we can extract from our existing university courses.

No account has here been taken of the purely professional studies, full successional courses in which are conditions determining proficiency. Such will necessarily be taught in special schools, or schools of specialties, just as law, mining, and medicine are taught to-day. And as Professor Huxley has characteristically stated the point, the more the intending specialist studies of his own branch and leaves the consideration of other branches for assistance or to possibilities afterwards, so much the better for the student and his following."

XIII

HIS DEATH AND TRIBUTES TO HIS MEMORY

One of the last papers from Angelo Heilprin's prolific pen, an article on the Catskill Mountains, appeared in the *Bulletin of the American Geographical Society*, for April, 1907 — only three months before his death.

He had returned from South America greatly weakened in health. His heart was seriously affected and the end was manifestly near. He lingered for two months at the house of his sister, Mrs. A. P. Loveman, in New York, until death came to his relief. He died on July 17, 1907, at the early age of fifty-four. Dr. Theodore Le Boutillier, Mr. H. L. Bridgman and Mr. Louis E. Levy spoke feelingly at the funeral.

Angelo Heilprin's character and achievement were becomingly commemorated at a meeting held in Philadelphia on November 6, 1907, under the auspices of the Geographical Society of that city. The society, in which he was greatly interested, had been founded largely upon his initiative.

Dr. Edward J. Nolan summarized the work done by Angelo Heilprin in connection with the Academy of Natural Sciences. The following are extracts from the other addresses made on that occasion.

Professor Russell H. Chittenden, Director of the Sheffield Scientific School, Yale University, said:

"Professor Heilprin's formal connection with the Sheffield Scientific School began in 1904 when he was appointed lecturer in physical geography. From that date one-third of each college year was spent at New Haven, and I came to know him with a degree of intimacy that served to reveal many of the sterling qualities of heart and mind, which all who knew him clearly recognized. With our students he was most popular, for they

quickly learned that he had intimate knowledge of the subjects on which he lectured; a personal acquaintance with the natural phenomena he so clearly depicted, which served to stimulate attention and interest, and led many a man to a fuller appreciation of the importance and significance of a study of Nature. Indeed, who could listen to Angelo Heilprin and not be impressed by his great breadth of knowledge, and especially by his enthusiastic interest in the subject to which his life was primarily devoted. His enthusiasm was contagious, and many a man who, at the outset, had little or no interest in the subject to be discussed would, on the completion of the course, show in an unmistakable manner the effects of the enthusiastic teaching of the master.

Angelo Heilprin in his own work was a stranger to half-hearted effort; intermittent attention to duty was not one of his characteristics. He belonged rather to that small group of men who appreciate the importance of insistent and consistent effort. He realized that opportunities are to be improved to the utmost, that success can come only from earnest effort, in harmony with that saying in Ecclesiastes, 'whatsoever thy hand findeth to do, do it with all thy might.' When Peary, in his search for the North Pole in 1892, was practically buried in the ice and snow of the Arctic regions, lost to the civilized world, and in grave danger of utter destruction, Angelo Heilprin, by hard and insistent effort, battling at every turn with the furious elements of that inhospitable region, successfully led a relief expedition which brought succor to a group of weakened explorers who could not have endured much longer the privations to which they were exposed. Skill, knowledge, experience, all available means at the disposal of man, were by themselves alone as nothing compared with the indomitable will, strength of purpose, courageous effort, and unflagging zeal of this leader of men, who, having found work to do, did it with all his might.

Again, what a forceful illustration of self-forgetfulness, of utter disregard of personal danger, of determined effort to reach the solution of one of Nature's mysteries, is to be found in Heilprin's work at Martinique and his later study of Mont Pelée. In that terrible destruction of Martinique, with its loss of 30,000 lives and the wonderful throwing up of the power of

Pelée, was to be found a striking illustration of volcanic power, perhaps not equalled since the destruction of Pompeii. Is it to be wondered at that the spirit of investigation was aroused to the utmost in this man's mind? Here was an opportunity rarely afforded to mankind. I doubt if the thought of danger, of possible death, of possible risk even, ever entered his mind. Here was something to be done; here a chance to broaden man's knowledge of volcanic phenomena; and he improved the opportunity to the utmost. I have often read the vivid description of his numerous ascents of Mont Pelée, even while the volcano was thundering forth its deluge of boulders and death-dealing vapors, but never without a thrill, and a feeling of admiration for the splendid courage and apparently unconscious spirit that permeated the man."

Henry G. Bryant remarked:

"As an associate of Professor Heilprin on the Peary Relief Expedition of 1892, I may be pardoned if I draw on some personal recollections to illustrate his methods while in the field. Whether contemplating a journey to the Far North or to the jungles of South America, he invariably familiarized himself with the existing literature relating to the region to be visited. He selected his companions with judgment and imbued them with his own enthusiasm.

As a result of fair treatment and unvarying courtesy toward the members of the Arctic Expedition referred to, in spite of the many vicissitudes of the voyage, every member of the party returned home a warm friend of his leader. One unique feature of that journey was the series of informal talks which he gave during the voyage relating to the fauna and flora, and especially to the glacial phenomena, of the regions we were visiting. One other incident I recall which made a marked impression at the time: it was late in August, and with the members of the Peary party we had on board we had made our way in the steamship Kite, to the southwest coast of Greenland — homeward bound. The weather conditions being favorable, it was decided to put in at Godthaab, a Danish colony, which is the capital of the southern district of Greenland. Needless to say, we were

heartily welcomed by the Danish officials and missionaries residing there. On the last day of our visit, as the long twilight of the Arctic summer faded into night — most of our company were assembled at the house of the assistant governor listening to some singing by the wife of that official. Our host presently invited Professor Heilprin to play on the new piano which had just arrived from Europe. Without a moment of hesitation he sat down and entertained us for an hour with selections from the works of Rubinstein and other composers, all executed with the power and expression of an artist. Never before or since, I venture to say, had those bleak shores heard such harmonies."

A tribute from the American Geographical Society and the Peary Arctic Club of New York was brought by Herbert L. Bridgman. He said:

"The Brooklyn Institute of Arts and Sciences, of which Professor Heilprin was a corresponding member and a valued lecturer, at its first meeting after his death, adopted a Minute, paying to him honor as an ideal student and teacher, possessing in a rare degree the power to discover and disclose the secrets of nature and the truths of science. Also the following appreciation from Commander Peary, whose name is a synonym for all that is greatest and best in Arctic exploration, was read at Professor Heilprin's funeral:

'I cannot begin to express my feeling of personal loss in his death. The loss to the scientific world, to geographical circles everywhere, to the Geographical Society of Philadelphia and the Alpine Club of America, both of which were the inception and children of his brain, can never be made good. But the loss to those who have known him intimately for years is beyond words.

My own obligations to and regard for him are particularly great. To him, more than to anyone else, is due the activity of this country in Arctic and Antarctic work during the past fifteen years; for it was his interest and belief in my first project for Arctic work, presented to the Philadelphia Academy of Natural Sciences in 1891, that led to the adoption of that plan by that organization, and the consequent awakening of interests in Polar matters in the years since then.

I always found him ready, loyal and superlatively able. When I named one of the greatest of Greenland glaciers and later one of the most northerly lands after him, it was no perfunctory action, but a tribute of the deepest regard and friendship.'

The American Geographical Society of New York, oldest organization of its kind in the country, also bids me express to the Philadelphia Society its own sense of loss of a co-worker, leader and an instructor whose words were always inspiring and whose example, both at home and in the field, was one of intelligent zeal and continuous loyalty. . . .

I can speak of Professor Heilprin as a friend, of a friend, though there was more than that mere superficial liking which passes sometimes for friendship. He made one conscious of keen and quick sympathy; of the sincere desire to encourage and develop in others no less than himself, something better and higher, thus making the pursuit of truth, the study of Nature, the investigation of its laws, but the means to an end. All of you who came into close personal contact with Professor Heilprin must realize what I mean much better than words can express, and in that fine individual assertion lay, I think, the chief source of his remarkable achievements. To him Nature was a friend, a companion to become acquainted with, to know by faithful observations, by honest, open-minded, wide-visioned study and comparison. To him, Nature was no sphinx nor tyrant, but rather a loving and leading power, to be cherished and interpreted and in whose laws were to be read those of the life and development of man. With this disposition, this essential appreciation, the inclusion of others became easy and genuine, and in this way the friendship based upon kindred tastes and interests grew to be a comfort, a strength and an inspiration. It does not fall to any one of us, perhaps, to take up the work which death has interrupted. That will, in the nature of things, adjust itself. It is, however, an obligation, a privilege, to treasure the memory and the ideals of this man and friend, whose life spoke so clearly, so nobly, which rang always true, whose echoes we can never fail to hear."

Professor William Libbey, of Princeton University, representing the American Philosophical Society, said:

"I am glad to have the opportunity of representing probably the oldest societies of America on this occasion. I am sorry to say that the notice which I received being late, will necessitate my speaking not so much upon Professor Heilprin's work as upon his character.

There are many vulgar estimates of greatness. The mere sense of isolation by elevation above the plane of common humanity is often gratifying to small minds, but it is far from satisfying, and its emptiness is often as apparent as the comments passed upon it. One is reminded of the question asked of a person who had taken a trip in a balloon, as to 'whether he did not suffer from the heat when he got so much nearer the sun' — forgetting that the further we get from touch with humanity, the colder it becomes.

I am afraid that many of us fill our lives with regret, at being confined to narrow fields of usefulness. We forget that the man with one talent is never held responsible for five. We have not learned the lesson of high endeavor and faithful plodding work. We have not lived up to that famous epitaph placed upon a Roman hero's tomb, which was considered his highest praise, 'Fortiter, feliciter, fideliter,' 'bravely, cheerfully, faithfully,' and know that these words covered a life of devotion, well rounded out and complete in all its details.

A commodore in our navy, when told by some one that the 'Congress,' a vessel commanded by his son, had struck her flag, simply said, 'Then Joe is dead.' Could any higher praise be given him?

How true this praise is of the lives of most teachers. To use Professor Heilprin's own words in an article in the *Forum* in 1900, 'a teacher is said to be impractical, to be a dealer in facts which bring remuneration to neither body nor soul.' However true this may be, the unheralded successes of a teacher's life are none the less real to himself, though we do not often stop to realize how much sacrifice they involve, and how much they mean to us. To the teacher in science this is especially true, because if he is true to his standards he gets closer to his students than other masters, as he has to study their capacities quite as much as his subjects.

I know of no field of scientific investigation so well fitted for exact training as that of geography, or one which involves so much preliminary work, not only in the study, but in the close investigation of nature.

It is in the intimate combination of these two spheres of activity that we find the secret of Professor Heilprin's success. He was an investigator by nature, and a teacher from choice. He believed that a little of real geography was worth a ton of theoretical geography. This was not to despise the theoretical side of the subject, far from it, but to galvanize it into life as only the enthusiastic field worker can do.

As with many other workers in this field, the mountains were his favorites; he worked along high levels in more senses than one. This actual contact with nature made him the greater power on the lecture platform and in the class room. His many publications have made a name and fame for themselves, but his personality and enthusiasm were the telling points of his character.

Henry Ward Beecher once said that the greatest men in this world were the 'shadow men,' men who had lived and worked and gone beyond, but whose strong personalities cast a long shadow across our horizon.

To-night we stand before such a shadow, and it points the way to greater earnestness and faithfulness; to greater joy in work, and perhaps, greater sacrifice. No life has been in vain which produces such a result."

Mr. Frank B. Greene spoke of his trip with Professor Heilprin in the Rocky Mountains:

"It was my good fortune to be a member of the party that in the summer of 1895 visited the heart of the Rocky Mountains under the leadership of Professor Angelo Heilprin. The company of ten was recruited mainly from his class in geology. . . .

The magnificent natural scenery of this whole region, of which even the matter-of-fact and technical descriptions in the reports of the United States Geological Survey read with the fascination of a fairy tale, could not fail to arouse the enthusiasm of the most unimpressionable tourist. Into the enjoyment of the picturesque features of this great panorama of Nature, daily

unfolded with unexpected and startling variety, Professor Heilprin entered with as much zest as any member of the party. When, by means of his explanations, there was added to superficial observation an appreciation of the relationship of one part of the picture to another, and of the geological significance of the formation and structure, the dullest of his hearers felt the range of vision enlarged till each aspect of the changing scene awakened a new and deeper interest. As a guide and instructor Professor Heilprin was seldom formal in manner and never pedantic. The members of the party were treated as comrades, courteously placed upon a footing of equality. When the pages of Nature's open book were being translated, it was with the assumption that the power of interpretation was a common gift and that he was acting merely as spokesman. There was no talking down to inferiors. The language was simple and generally devoid of scientific phraseology. . . . He who could spend much time in companionship with Professor Heilprin and find life dull or uninteresting must have been irresponsive and stolid. His manner was genial, his conversation brilliant, his fund of information extraordinary. His learning was not confined to the realm of science. Music, art, history and literature were fields in which he was no stranger. There was often the sparkle of wit in his remarks, and he had a ready appreciation of humor, but when it seemed out of place it was as distasteful to him as a discord to the sensitive ear of the musician."

Dr. Theodore Le Boutillier sketched Professor Heilprin, the man. He said in part:

"In 1896 it was my good fortune to have been his only companion upon his trip to Morocco, Algeria and Tunis, where he definitely determined that the Atlas mountains are a continuation of the Alps and geologically co-existent. This close association for two months was a wonderful revelation of a strong personality and a noble character. Whatever difficulties or disappointments arose, he maintained a calm and good nature, and, with his usual resourcefulness, was always ready to substitute some equally satisfactory plan. It was astonishing to find that his information and judgment extended to such things as rugs, pottery, even embroideries and so forth.

He had a comforting way of displaying to an average individual, like myself, a quite human weakness for some of the ordinary enjoyments of life. I have a vivid recollection of our feast of ice cream at Marseilles. Immediately upon our arrival from Africa we hastened to the first confectioner, where to the astonished enjoyment of the proprietor and a crowd of onlookers we quickly vanquished three portions each.

Socially, was again displayed Mr. Heilprin's adaptability to all conditions, and all types of people. One need not have been profound or talented to claim his attention and courtesy, or enjoy his conversation, which was frequently bright and sparkling. His wit was never caustic, but often had a droll facetiousness highly amusing, whatever the mental status of his hearers. That reminds me of a trip which some of the members here present took with Professor Heilprin in 1893. We were on a canal boat for several days and the owner of the canal boat, a man by the name of Countryman, gave this statement of Mr. Heilprin, which I think shows clearly and exactly what persons who were brought into contact with him — those of a lowly station in life — thought of a man of his wonderful character. He said: 'That chap you call the professor is a good man — I did n't know such men lived as he is.' I think that is one of the most touching tributes I know of. This man, who had no opportunity, and who spent his life as a captain of a canal boat, realized the strength and force of character of the man he was with. It was something that shows us the personality and how he impressed everyone who came into close touch with him.

We who know him intimately never heard him make an unkind remark or in any way belittle the efforts of anyone who was conscientiously striving to obtain or dispense knowledge. On the other hand he was fearless in contradicting or combating any statement which he believed to be inexact or misleading.

Mr. Heilprin's talent for music, as well as that for drawing and painting, was an almost spontaneous expression, for except a few lessons in childhood he had little instruction in either.

Only those who cherished his personal friendship, before whom he sat in quiet self-forgetful abandon, playing on the piano some soul-stirring Hungarian national air, some fan-

tastic Hungarian dance, or perhaps some weirdly melancholy strains of Hungarian folk-songs; only those understood how this wonderful soul was in touch with the enchanting world of melody.

Whatever it was: song, dance, rhapsody, or patriotic hymn, it was vitally Hungarian, and showed how into his innermost fiber was woven the idea of Hungarian liberty."

Commander Peary sent the following telegram to the meeting:

"Philadelphia Geographical Society,
Witherspoon Hall, Philadelphia:

Deeply regret to find at last moment Mrs. Peary and I unable to be present to-night as we had intended. News of the death of Professor Heilprin came to us with the shock and feeling of loss of a personal bereavement, from which we have not yet recovered. A man among thousands, Professor Heilprin's place can never be filled. Your Society and the Alpine Club of America, both children of his great brain, both distinctive in the scientific field of this country, will always endure as monuments of his great ability and far-sightedness. You and all your secretaries know that to him was due primarily the renewal of interest in Arctic work in this country which began sixteen years ago, and which has not yet reached its culmination. Strong, resourceful, deeply loyal, and superlatively able, he was the personification of Mark Antony's words, 'My friend, faithful and true to me.' With us as with all who had the honor and privilege of his acquaintance and friendship, his memory will always be green.

PEARY."

XIV

PERSONAL TRAITS

The loss to the family was indeed a grievous one. To them he had ever remained as he was in his childhood, gentle, sunny and care-free, giving and receiving unbounded affection. The days of his home-coming, whether on a visit from Philadelphia or on his return from distant countries, restored to the members of the family the full joys of a household united in harmonious pursuits and common pleasures. He was the life of every circle in which he found himself — whether at home with his relatives, in a camp in the wilderness, on board of a European steamer, in the most formal society or in a primitive country boarding-house. He loved to unbend and take his place with young and merry folk, but if the occasion called for it, and he felt sure of a sympathetic listener, he was always ready to give of the vast stores of his experience and learning, and could hold spell-bound the improvised audiences that would gather around him. He was thoroughly democratic, without effort or consciousness. Though fond of the society of congenial women, it was his destiny to remain single. Official distinctions, which came home to him from this country and from abroad, he prized chiefly for the pleasure they gave to his relatives. When he was elected a member of the Royal Geographical Society of London he wrote to his mother:

"I know you will be pleased to learn from the enclosed that the Royal Geographical Society of London has just elected me to fellowship in their body. When you used to read to me so pleasantly books on travel and geology — and I remember specially Wallace's 'Malay Archipelago' — it was one of my ambitions to become elected to this body. With the years that

LOUIS HEILPRIN
NG BOYS
aken in the early 'Sixties

have passed I no longer look with exactly the same feelings toward recognitions or associations of this kind — the world of knowledge is not quite so solid as it at one time appeared — but yet I cannot help being pleased that an old wish has so unexpectedly been gratified; but it gives me most pleasure to have this honor, if honor it is, associated with your motherly assistance.

Your affectionate son,
ANGELO."

More than such outward acknowledgments of his standing in the scientific world — he was President of the American Geological Society from 1891 to 1898, became later President of the Association of American Geographers, etc. — he perhaps prized success in accomplishing what he set out to do in fields entirely unconnected with his scientific pursuits. He was gratified to obtain patents for several mechanical devices which occupied his leisure hours. Thus, in January, 1882, he was granted a patent for his invention of a contrivance for mechanically turning leaves of music at the piano, and in April, 1896, his ventilating railroad-car window was granted a patent. For this invention he was awarded the Edward Longstreth medal of the Franklin Institute in 1897. Pecuniarily he never profited in the least by his inventions. Attainment of a full measure of success in his artistic endeavors — which perhaps was one of his ambitions — was denied him, owing, at least in part, to lack of systematic instruction in both music and painting, but he received decided popular recognition for what he did as a painter. His eight paintings of the eruption of Mont Pelée — now loaned to the American Museum of Natural History and adorning its walls — arrested the attention of artists and critics on their exhibition in Philadelphia and at the Century Club of New York. A writer in the Philadelphia *Ledger* said of the pictures:

"An exhibition of exceptional interest, shadowed only by the melancholy regret that the artist is no longer alive to continue his distinguished scientific career among us, is in progress at the Academy of the Fine Arts, where eight paintings done in Martinique are lent by the family of the late Angelo Heilprin, the

collection having been secured through the courtesy of the Geographical Society.

The eminent naturalist was so identified with research work along geological and zoölogical lines that it is less generally known that he was a painter of no small degree of skill, who contributed canvases to prominent picture displays. The interest of his Mont Pelée sketches is not alone in the tragic upheaval of elementary force which they commemorate; a purely artistic value also attaches to the paintings. Some are small sketches made when Doctor Heilprin was in Martinique, a story attaching to one of these relating that as he painted he was obliged to shield the canvas with his body from the rain of ashes. Others, larger in form and more carefully worked out than would be possible under conditions of such primeval chaos, have been elaborated from Martinique color studies helped out by a memory not only trained, but impressed past ability to forget by the scenes of desolation witnessed.

The place of honor is given to a presentation of the 'Tower of Mont Pelée,' which shows the great shaft as it appears when the sunlight turns its deathly ashen tint to rose color, the beautiful natural miracle which may be watched daily in Switzerland. Here is the artist's idealization of the normal, the stern shaft of rock rising into the pitiless blue of a tropic sky above cloud masses of vari-colored vapors. Beside this is a view of the volcano in eruption as seen from the graveyard Marigot. Here Doctor Heilprin's point of view became dramatic and directly decorative. Dark cloud masses in sombre richness veil the mountain, relieved against which a great crucifix rises in gaunt majesty. . . .

A white light, which does not explain itself altogether, strikes coldly into the middle distance, while the diminishing line of a blasted tree and rows of memorial crosses (skilfully managed so as not to create a monotonous line) still further compel the imagination of the spectator to appreciation for the painter's poetic conception. 'Into the Crater,' an unfinished work, is a mass of unfathomable shadow such as envelopes one who descends far below the earth's surface, beyond power of the blessed light to follow. A sinister mass of living red in the lower left-hand corner of the canvas glows like the eye of some cosmic

Fafner ready to devour again and yet again. 'An Eruption of Mont Pelée' is a mere suggestion of the lines of the mountain seen against a pale sky, but the artist's interpretative poetry is again evidenced by the details in the 'Afterglow of the Ash-cloud,' where the jagged line of a nearer mountain and skeleton trees are utilized with a sense of decoration truly Japanese. 'The Majesty of Mont Pelée-Inferno' is the title of an elaborate rendering of a veritable sea of vapor, whose billows and waves rise higher and higher in a hundred prismatic colors, all modulating again from the same sinister glow in the soul of its currents."

Exact reproduction of a pencil drawing of a Map of Greenland made by Angelo Heilprin at the age of six years

Perhaps the most interesting specimen of Angelo Heilprin's skill is a little map of Greenland made by him at the age of six. It was sent by his father in a letter still in the possession of the family, which bears the date of April 29, 1859 (when the boy was scarcely one month past his sixth birthday), to the grandfather, who was then in Paris. When the map was discovered, many years afterwards, and shown to Angelo Heilprin as the work of a child of six, he maintained stoutly that this could not possibly have been the case, but showed great interest

watch his confusion when he
able evidence that the map was
d that at such an early age he
ant country part of which was

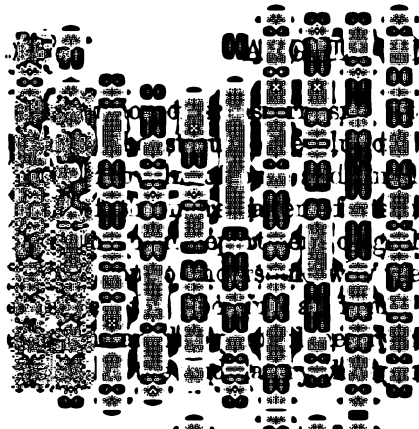
XV

ANGELO HEILPRIN AS LECTURER

Many and varied were the activities which Angelo Heilprin crowded into his comparatively short life. After his first return from Martinique he was in great demand as a popular lecturer. He spoke at the Cooper Institute in this city, at the Brooklyn Institute, and in various cities of New England and the South. His method in addressing miscellaneous audiences can best be illustrated by reproducing his lecture on *The Geological Evidences of Evolution*, which is doubtless one of the best popular expositions of the subject. The little book is now out of print.

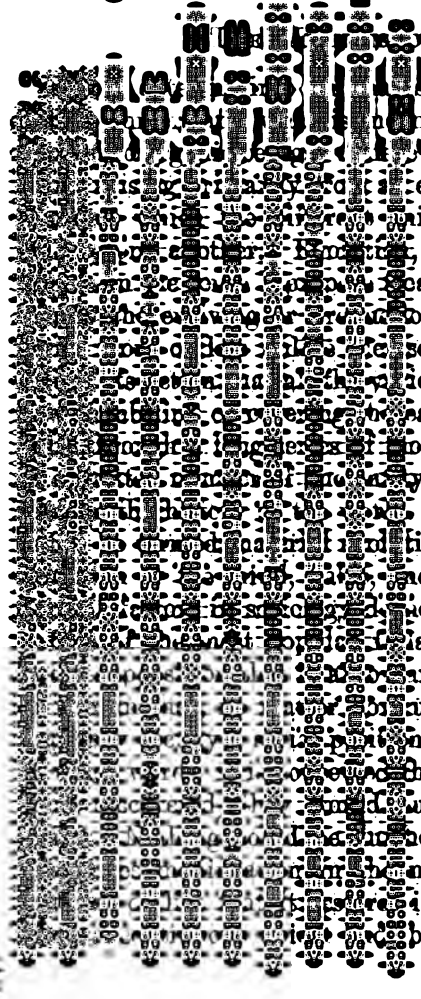
I

"Just fifty years ago this year were planted the germs of a train of scientific speculation whose development was destined to mark an epoch in the history of science — to work a most profound revolution in the tendencies of modern thought. It was then that Charles Darwin first conceived the idea of investigating that mystery of mysteries, the origin of species, and it was then that he laid the foundation of that remarkable work which some twenty years later was destined to convulse the scientific world. Nearly thirty years have now elapsed since the 'Origin of Species' first saw the light of day, and although in its infancy it met with but few adherents to its general proposition that all existing organic forms are but modifications of, or derivatives from, allied or previously existing forms, it numbers at the present day an equally small, or still smaller, number of opponents. It may safely be said that no broad scientific generalization, unless possibly it be that of the Correlation of Forces, ever met with such ready acceptance as did the doctrine



EILPRIN

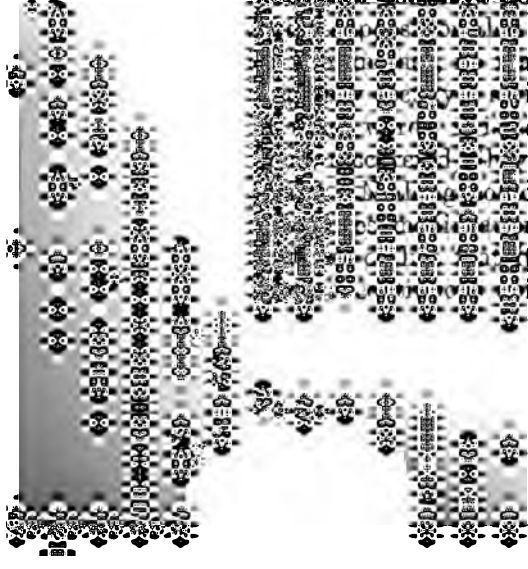
is not my purpose to-night to which has long since passed e theory, but to present to you earing upon its proof, drawn logy and palæontology, as will greater number of naturalists established to-day as is the evolution, the theory of gravi- f light.



Evolution

sis of this evidence, it will be nt by the term 'evolution' as is much misconception on this erroneous interpretation of the imal and vegetable organisms , in its more common accepta- cating of it to-night — signifies on of new organic forms from selves; it recognizes as the re- ied animal and vegetable forms earth's surface are the descend- odifications or transformations, ypes whose ancestry lies buried As a corollary of this, which ion, we have an accompanying d consciousness, but these im- ot concern us this evening.

acies connected with evolution anic forms are mere derivatives unlike they may be, it follows n with reference to each other; hat if all the connecting forms uild up a continuous organic er from the truth; evolution most divergent directions, and is not a straight stem growing but a stem, or possibly even a



limited number of stems, branching in varying directions. The bird, which, in our conception of structural organization, stands intermediate in rank between the reptile and mammal, appears to be a descendant of the former, the reptile, but the mammal, which immediately follows the bird, has little or no connection with it. One line or the other is a side line, and there can be no connection between the two except at their points of divergence.

Granting the truth of the doctrine of evolution, what is the nature of the proof that would be required of the geologist to establish its validity? He would be required to show, in the first place, that there has been a steady advance in the type of structural organization from first to last — not a necessary elimination of forms of low degree, but an overbalancing of these by forms of a more complicated or higher grade of structure. Evolution does not hold, as some opponents of the theory would lead us to suppose, that the progressive modification of individual organic forms need be, or indeed has been, one of continuous advance; it recognizes merely a general advance for the entire organic frame, while it admits of individual retardation or degeneration. Its progress or procession is the equivalent of the progress seen in the development of civilization; the united world advances, whereas individual tribes or nations remain at a standstill, or even degenerate and decay. Such is precisely the history of the organic development of our planet; new and more complicated organic types are being continually evolved, but side by side with these forms we still meet with those of a lower grade of organization, while still others, belonging to the earlier periods of the earth's history, have completely dropped out.

As a second proof of his position the geologist would be compelled to show the lines along which certain organic forms have developed; to speak more explicitly, he would be required to indicate a number of transitional types intermediate in their relations between forms otherwise apparently far removed from one another. These are the so-called 'missing links.' Furthermore, these missing links must appear at definite geological periods, and not promiscuously at all times and places.

This is practically the sum total of the proof that would be required of the geologist, and I believe that I shall be able during the course of the evening to show to your entire satisfaction that he can furnish this proof, and furnish it in a most convincing manner.

Different Geological Periods

I have placed before you a chart representing the different geological periods, beginning with the oldest at the bottom and ending with the newest on top. I have so arranged it that each vertical inch of its surface covers 2,000 feet thickness of deposit belonging to each of the several periods of time, the maxima of thickness occurring at any one part of the earth's surface having been selected. You can thus determine for yourselves the relative values, as measured by the thickness of the several deposits, of the different periods of time, an important consideration in dealing with the life-histories of animal groups. Now, when we seek to investigate the life-histories of the different periods indicated on this chart, we are immediately struck by the very remarkable progression of the animal forms distinctive of those periods. Instead of meeting with a promiscuous association of animals of lowest and highest organization, we find a general advance in structural type from beginning to end. It is true, we cannot in all cases indicate that a type of higher or more complicated organization invariably followed a lower type belonging to the same group, but as a general rule we note that there has been a steady advance in type structure. What is the nature of this advance, or the essence of the first required proof?

Looking at the animal kingdom broadly, and without attempting to destroy the perspective by inquiring into unnecessary details, we find that of the two great divisions into which that kingdom is divided, the backboned or vertebrate animals, like the fish, reptile, amphibian, and quadruped, and those without backbone, the Invertebrata, like the coral, starfish, crab, etc., only the latter is represented in the earliest period, the Cambrian, in which indisputable animal remains have been found. Not a vestige of any of the higher forms has here

been met with. But let me warn you against this non-appearance. It is by no means impossible, or indeed unlikely, that backboned animals already lived during this period of time, and that their remains will still some day be discovered. The fact, however, that the Cambrian deposits have been so extensively studied, and that no such remains have yet been found, renders it more than probable that the animals of this class, if they existed at all, existed in very small numbers; and there can scarcely be a shadow of doubt that their real development followed that of the animals without backbone, whose remains are so numerously scattered through the rocks. And let me warn you further that the future finding of a few vertebrate remains in the Cambrian deposits will be no evidence against the doctrine of evolution — not until these remains will be found very much more numerously than there is a prospect of ever finding them.

In the period succeeding the Cambrian, the Silurian, we find the first traces of backboned animals, — and what are they? The lowest members of the series, those which exhibit the least development of the sense organs — the fishes. These animals are numerically insignificant during this era, and appear only towards its close; in the period following, the Devonian, they become very abundant, so much so that this period has been aptly designated the 'Age of Fishes.' But neither here, nor in the period preceding, the Silurian, has there ever been found a vestige of an animal higher in the scale of organization than a fish. In the rocks of the Carboniferous period do the first of the more highly organized animals appear, but only in forms, as far as it is possible to determine from our knowledge of recent animal life, whose early existence is passed in an ichthyic or fish-condition. These are the amphibians, the group to which the frogs and toads, the newts and salamanders belong — animals, as we all know, and as we see exemplified in the tadpole, whose larval forms breathe the oxygen of the water by means of exposed gills, and which in their advanced or adult stage, develop true lungs, and thus approximate the reptilian condition. But we meet as yet with no true reptiles. These appear for the first time in the rocks of the succeeding period, the Permian.

We have now passed through about two-thirds of the known cycle of geological history, or completely through what is known as the Paleozoic period of time. In the Triassic period we have the first evidence of the existence of the highest animals, the mammals, and in the period following this, the Jurassic, of birds, an apparent contradiction to the order of appearance.

Fishes and Amphibians

Let us here enter somewhat more closely into an examination of the order of appearance that has been outlined, and see what it signifies. I believe we shall find in its analysis both kinds of evolutionary proof that we are in search of. But in order to do this we must satisfy ourselves as to the relationships to one another of the different animal groups whose histories we have followed. What is a fish, what is an amphibian, and what is a reptile, and what relationship do these three groups bear to one another? I can in this place only briefly indicate the essential anatomical features of these groups. Beyond having the characters belonging to the Vertebrata in general, fishes may be described as cold-blooded, water-inhabiting animals, breathing by means of gills, having but two chambers to the heart, and rejoicing in a purely systemic circulation — *i. e.*, the arterialized or oxygenated blood instead of being returned to the heart before being finally distributed, is carried directly from the gills to the different parts of the body. The body, moreover, is provided with fins, which fins are supported by fin-rays. When we compare this general structure with that of an amphibian, such as a salamander or frog, we naturally find much difference. The frog breathes by means of lungs, is largely an inhabitant of the land, has three chambers to its heart, has a true pulmonary circulation — the blood being first returned from the lungs to the heart before it is finally distributed — and the body is destitute of fins and supporting fin-rays. Thus, there would appear to be but little connection between these two classes of animals. When, however, we inquire into the early history of the frog we find a very close connection, and one that proves the young frog to be more of a fish than anything else. The familiar tadpole

or fish-like form is an inhabitant of water, and like the fish it breathes water by means of gills; it has but two partitions to its heart, a non-pulmonary circulation precisely like that of the fish, and the body provided with fins, which are, however, destitute of fin-rays.

Leaving out certain differences in the osteological structure of the cranium, we might indeed say that almost the only striking character separating this larval amphibian from the fishes is the absence of fin-rays; but in whatever way we look upon it, the creature is much more a fish than anything else, and differs less from certain fishes than these do from each other. So that to all intents and purposes the frog is a dual creature — a fish in its young stage and something else afterwards. Why then, it might be asked, separate the amphibians from the fishes at all? The master mind of Professor Huxley has solved this question. The fishes and amphibians are but sub-groups of a single division, known to naturalists as the Ichthyopsida. I have thus far indicated to you only a one-sided relationship. The amphibians not only approach the fishes, but the fishes approach equally the amphibians. There exist a limited number of fishes, known as 'mud-fishes,' inhabitants of the waters of South America, Africa, and Australia, which depart from other fishes so widely as to be properly constituted into a distinct class of their own. They are provided, in addition to gills, with true lungs, by means of which they respire the oxygen of the air directly, and with which there stands in immediate relation a pulmonary circulation, operated by a heart with three chambers.

Reptiles

Having thus established the relationship existing between fishes and amphibians, it will be well to consider in how far this relationship also extends to the third group of cold-blooded animals, the reptiles. Manifestly, a reptile is most closely related to the amphibians, from which it differs primarily in never breathing by means of gills, and in having but a single articulation to the base of the skull, instead of the two seen in an amphibian. It may also be added that the amphibian

has a naked skin, whereas nearly all reptiles are provided with scales or plates developed in the integument. In other important points of structure — such as the lungs, heart, and circulation — a reptile agrees essentially with an adult amphibian, and indeed more so than certain reptiles agree with one another. The amphibian is, in truth, an animal that binds the three groups together.

The Earliest Amphibians

If we now ask ourselves what are the relative positions of these three groups, the answer is a very simple one. The amphibians are obviously higher than the fishes, since they pass from, or through, a fish stage to maturity; developing in the direction of the reptile, they naturally point to the latter as the superiors in the scale of organization. Recognizing this position, what is the nature of the geological history that they would be likely to tell? That the fishes appeared first, that the amphibians came next, and that these were followed by the reptiles, just as we have seen it actually to have been the case. It is a remarkable fact, and one most confirmatory of the doctrine of evolution, that the history of the individual development of an animal frequently repeats the development of the broad group which it represents. But geological evidence is not entirely satisfied with the evidence of succession, corresponding to the law of development, which I have just given you; it must sooner or later show that in the period intervening between the first appearance of fishes and the earliest development of amphibians there existed a type of fish more closely related to the amphibian than the ordinary fishes — in other words, a connecting link more or less closely related to the mud-fishes. Such a form we find in Dipterus and its allies, fishes that belong to the Devonian period of time; and if any proof were further wanted indicating the antiquity of the existing group of lung-fishes, we have but to point to the occurrence of one of our modern genera, Ceratodus, already in the deposits of the Permian period. Ceratodus, in fact, represents the oldest living vertebrate type known to naturalists.

There is a remarkable structural peculiarity belonging to

a very large number, if, indeed, not to the vast majority, of the earliest amphibians, which seems to distinguish them from all the modern members of the same group of animals. This is a singular labyrinthine infolding of the substance of the teeth, which has given to the group the name of the Labyrinthodontia. Now it is a surprising circumstance that many of the most ancient fishes, or those which preceded the labyrinthodonts in time, have this same peculiarity of structure, and at the present day we have still a form, the alligator-gar — one of the last remaining survivors of that ancient ichthyic group, the ganoids — which retains this peculiarity of dental structure. From what has already been said, I believe it will be admitted that we have the strongest kind of evidence to show that the amphibians have been developed from the fishes, and further, that one of the most striking characters of these most ancient amphibians is a character which had already been developed in that class of animals whose position is unmistakably below them in the scale of organization.

The Earliest Birds and Mammals

Passing now to a consideration of what some choose to call the rather anomalous appearance of birds and mammals in Mesozoic time — *i. e.*, the appearance first in time of the more highly organized group — I am compelled to ask, in what respect is this appearance anomalous? What special relation do these two groups hold to one another and to the animals that succeed them; and in accordance with what law should it be required that the order of appearance be reversed? Manifestly, only if it can be shown that the line of descent of the mammal passed through that of the bird; otherwise the two need bear no special relation to one another. What is the zoological position of the bird, and what that of the mammal? At first sight a bird appears to be most sharply defined, and absolutely isolated, from all other members of the great group of animals. And our conception of this isolation would probably have remained intact to the present day were it not for the very remarkable discoveries which the palæontologist has brought to light during the last half-century.

The Archæopteryx

Briefly defined, a bird is a hot-blooded vertebrate animal, provided with feathers to its body, with a complete pulmonary circulation operated by a four-chambered heart, and with the anterior appendages so modified as to permit of navigation through the air; the mouth is destitute of teeth, a character which serves to separate it from the greater number of other vertebrate animals. This is our conception of a modern bird. But what has been its earlier history? I have placed before you the figure of a remarkable creature, known as the Archæopteryx, only two individuals of which have thus far been discovered. The first, now deposited in the British Museum, was found about twenty-five years ago, and the second some ten years since, and constitutes to-day one of the treasures of the museum of Berlin. They were both found in the lithographic-stone quarries of Solenhofen, Bavaria, and in deposits that by geologists are referred to the Jurassic period of time. This remarkable creature, which was of about the size of a raven, had a generally bird-like head, but differing from all modern birds, the head was supplied with true teeth in the extremities of both the upper and lower jaws, which teeth were implanted in distinct sockets, as in the more highly constituted reptiles. The body was provided with well-developed feathered wings, but again, departing from true birds, the rest of the body, except the tail and parts of the legs, appears to have been either largely naked, or but scantily clothed with feathers; the legs and feet were bird-like in structure, but in the hand and tail we have a remarkable combination of reptilian and avian characters. The latter, instead of being made up in principal part of feathers radiating from a greatly condensed vertebral axis, is prolonged into a long succession of vertebræ, from two sides of which feathers are given off in pairs.

Is this creature a bird or reptile? I am free to admit that I am unable to answer this question to my absolute satisfaction, although I would probably say that it is more nearly bird than reptile. But if bird it is manifest that we must very considerably modify our conception of what a bird really is.

We must modify our notions as to the value of the character afforded by the absence or presence of feathers, and deduct from our definition that part which pertains to the presence of teeth. But that the matter of teeth is of no very great moment is proved by the existence of these structures in a group of remarkable and indisputable birds, which have been discovered during the last few years in our own western territory. These are the Odontornithes, of which two members, Ichthyornis and Hesperornis, are represented on the diagrams before you.

Relations between Birds and Reptiles

That these earliest birds were largely reptilian in character can, with the evidence before us, scarcely be gainsaid; and if it can be shown with equal force that many of the earlier reptiles possessed characters belonging to birds, have we not the right to assume that the two classes of animals are very closely related, and that they belong to one and the same stock? And since the modern birds have practically dropped all their reptilian characters, have we not the right to assume further that birds are descended from reptiles, of which they represent only a diverging group? Is it not merely a repetition of the tale that is furnished by the development of the amphibian from the fish — so beautifully shown, apart from geological history, by the tadpole before our eyes — and the reptile from the amphibian? It is true that we know of no modern bird which passes through an absolute reptilian stage, but does not embryology tell us that one of the primary structures separating birds from reptiles, the feather, is merely a modified scale, and that it originates as a true scale?

If the combination of the modern and ancient characters of birds approximates them so closely to reptiles, what indeed, it might be asked, are the fundamental characters which separate them from reptiles? We have still the four-chambered heart, the presence of wings, and certain structures connected with the hinder extremities. But the first distinction is immediately disposed of by the case of the crocodiles and alligators, which, alone among reptiles, have the four recognized

chambers of the heart belonging to the highest animals. The matter of wings is also disposed of by those remarkable reptilian creatures belonging to the same epoch of geological time as the earliest bird, the pterodactyls, which in many other characters — such as the light structure and manner of support of the head, the presence of a well-developed keel or carina to the breast-bone, etc. — also approximate the birds. Furthermore, we are well aware that in the large group of struthious birds — the ostriches, cassowaries, and apteryxes — the wings are so little developed as to be all but functionless. We are hence driven to the remaining characters derived from the structure of the hind-quarters and their appendages.

The most careless observer is aware that a bird can at almost all times be distinguished from a reptile by its mode of progression — its elevation on the hinder extremities alone. But this mode of progression does not differ more from that of a reptile than does the method of a snake from that of a turtle, yet both are reptiles. It is in the relative disposition of the parts that we find the important difference. In all birds the pelvic girdle, which consists of the three bones recognized in man as the pubis, ischium, and ilium, has the pubis directed in a direction more or less parallel with that of the ischium; in other words, backward. In all reptiles, on the other hand, this bone is directed forward. Again, in all, or nearly all birds, there is a prominence, known as the cnemial crest, developed on the upper part of the tibia, for the attachment of the powerful muscles of the leg. This is wanting in reptiles; and further, there are certain peculiarities connected with the articulation of the foot to the leg in birds which almost immediately serve to distinguish these parts from the similar parts of reptiles. Have we any reptilian forms which at all meet the divergencies in character here brought out?

Dinosaurs

All of you who have visited our museum will remember the large animal, mounted on the east side, which was discovered on the Hopkins Farm, near Haddonfield, N. J., some thirty years ago. The Hadrosaurus, as it is called, is the represen-

tative of a large group of reptiles, the dinosaurs, or terrible reptiles, many of whose members depart just in that much from other reptiles as is indicated by the above characters supposed to belong to birds. In other words, we have here both small and giant animals, whose progression was either largely, or mainly, effected by the hinder appendages alone; in which the pubic bone of the pelvis was directed backward, more or less in a direction parallel with that of the ischium; in which the tibia was provided with a well-developed cnemial crest; and in which, finally, the ankle-joint of the foot and the disposition of the toes were in accordance with the disposition seen in birds. Many of these animals, furthermore, had the pneumatic character of the bones of birds, ensuring a certain amount of lightness to an otherwise ponderous frame. These singular creatures, one of which, the Iguanodon, is represented in the diagram before you, first appeared in the Triassic age, or in the period immediately preceding the advent of the earliest known bird, Archæopteryx, although they do not acquire any special development until the period following, the Jurassic. It is to them that we owe those remarkable foot-tracks which have made the red-sandstone of the Connecticut Valley famous, and which for full half a century after their discovery were unhesitatingly referred to giant birds of a type thought to be more or less identical with that of the ostrich. So singularly striking are the bird characters of these reptiles, that for many years they have been looked upon by many naturalists as the stock whence the non-flying or ostrich-like birds have been derived — the pterodactyls, or winged reptiles, furnishing the line to the winged or flying birds — and, indeed, it has been thought that very nearly the exact type could be pointed out which gave departure to the birds. This has been indicated by Professor Huxley to be near to Compsognathus. However correct or incorrect this determination may be, there can be no doubt in the face of the evidence before us, as coming from the side of both reptile and bird, that the two classes of animals are simply modifications of the same stock, and that the one (the bird) is a derivative of the other (reptile). The zoological relationship clearly points to the nature of this derivation, which the geological evidence amply and fully confirms.

OF MAMMALIA

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MMALS AND REPTILES

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between the two. From the existing evidence before us we are safe in concluding that the line of descent of these animals is direct from a reptilian stock; and this being admitted, there is no anomaly in the fact that the mammals appeared before the birds. Both birds and mammals are divergent modifications from a common axial stock. It is certainly an interesting feature bearing upon the reptilian relationship of the Mammalia that the earliest reptilian forms, those of the Permian period, are the only animals which possess the remarkable dental characters of the Mammalia. These, as is well known, have the teeth divided into three series — incisors, canines, and molars — a structure unknown among other living animals. But in the reptiles of the Permian period, which may perhaps be looked upon as the ancestral stock whence the Mammalia were derived, the same dental feature is presented.

II

We have thus followed the succession of the higher groups of animals through geological time, and find that this succession is one that is in perfect harmony with structural relationship. Had we no other evidence to offer in favor of evolution than that which I have laid before you as coming from fishes, amphibians, reptiles, and birds, this evidence, in my mind, would of itself be amply sufficient to prove the position. But there is no lack of other evidence, and evidence fully as strong, and, if possible, still stronger than that which I have given you. Thus, if we trace the histories of the primary and secondary groups of the larger divisions of the animal kingdom, we meet with a repetition of much the same order of appearance. The fishes, for example, are represented in the oldest formations exclusively by such forms as betray a comparatively low grade of organization; these are the sharks and ganoids, in which the vertebral column remains largely in the embryonic condition, becoming only partially ossified in most cases. The lung-fishes, which are a direct modification of the ganoid type, representing, however, a considerable amount of specialization in the development of a respiratory apparatus adapted to breathing directly the oxygen of the atmosphere, appear considerably

later, possibly in the Carboniferous period, but are already preceded by an intermediate type, that of the dipteroid ganoid. The more highly organized fishes, the teleosts, or bony fishes, appear for the first time, as far as we know, in the deposits of the Cretaceous period, and may consequently be looked upon as a comparatively modern group; but even here we find that this highest group was immediately preceded in time by a type of ganoid-plated fishes, the Leptolepidæ, which in so far partake of the characters of both ganoid and teleost as to have induced naturalists to place them alternately now in the one group, now in the other.

Elimination of Lower Forms

When we cast a broad glance over the existing fish fauna of the globe, and compare it with that of the earlier geological periods, we find that it differs, not only in the introduction of types of a higher grade of organization, but in the actual elimination of the lower structural forms. The ganoids, for example, which are numbered by hundreds of species in the interval between the Devonian and Jurassic periods, are practically extinct at the present day, numbering but a mere handful of species. A somewhat similar, although less marked, elimination is also distinctive of the selachians (sharks, rays). We thus find a complete rotation marking the succession of these animals. Evolution or transformism is the expression of necessity for a change; hence, the rotation of forms. Among the amphibians, reptiles, and birds, likewise, we observe that the older forms are very different from those now living, but the difference becomes less and less marked as we approach the present day. The same holds equally true with the mammals, whose earliest representatives are again forms of a very low grade of organization. These are the marsupials of the Triassic and Jurassic periods, forms more or less closely allied to some of the lowly types inhabiting the Australian continent.

The chart before you indicates the rise and fall of this highest order of animals. It will be seen that they date their first appearance from the Triassic period, where, however, there

are but three or four genera, and a barely larger number of individuals, represented. One of these, and the first species described, is on the table before you, known as Dromatherium. A further development takes place in the Jurassic period, when a broad hiatus follows. No mammalian remains have thus far been discovered in any indisputable Cretaceous deposit, and I may at once confess my inability to satiafactorily account for this non-appearance. But I feel perfectly safe in prophesying that they will yet be found, and were I as sure of many other things generally considered positive as I am of this one, I could remain satisfied.

The Origin of Our Modern Fauna

In the first stage of the Tertiary period, known as the Eocene, we meet with the earliest of the placental mammals, or those forms in which direct union is established between the young and parent during the process of development. From this period, it might be said, dates the origin of our modern fauna. It will be seen from the chart before you that only about one-half of the existing orders of quadrupeds are represented in the Eocene period; these are the marsupials, insectivores, rodents, whales, hoofed-animals, bats, lemurs, and possibly even monkeys. In addition to these there are a number of orders which have no living representatives at the present day. In the Miocene, or middle Tertiary period, there are superadded the edentates, or toothless animals, the carnivores, sirenians, elephants, and true monkeys. *Per contra*, the special Eocene orders to which reference has just been made, have completely disappeared, so that in the Miocene period only those orders of quadrupeds are represented which have living representatives in our existing fauna. But it must not be construed from this that there is a true faunal identity; this only appears in the most recent or Post-Pliocene period.

Lessening of Faunal Differences

From the beginning of the Tertiary period to the present day there is a steadily progressive approximation to modern

type-structures, but this approximation is a very gradual one. This will appear clear to you when it is stated that, with barely a single exception, not only are all the Eocene species and genera of mammals different from those of the present day, but even the families are very largely different; furthermore, there are a number of orders indicated which have no representation in the modern fauna. The only known living types of mammals which are generically represented in the Eocene period are two genera of bats — Vespertilio and Vesperugo — and the opossum (Didelphys). In the Miocene period the faunal difference is measurably lessened by the elimination of the special orders which belong to the period preceding, and by the introduction of a considerable number of modern genera, such as the porcupine, beaver, squirrel, rabbit, tapir, rhinoceros, hippopotamus, hog, deer, giraffe, elephant, cat, dog, and hyena. The families, moreover, are very largely identical with existing ones, so that in its entirety the Miocene fauna may in a broad way be looked upon as distinctly modern. The species of this period are, however, all, or nearly all, distinct from those now living. In the period following, the Pliocene, there is a still further approximation to the modern fauna in the introduction of an additional number of existing types — such as the sheep, goats, and oxen, the bear and camel, and among monkeys, the macaques. Indeed, the greater number of the genera are identical with the genera of to-day, and even a limited number of living species appear for the first time. One of these is the common hippopotamus, which, consequently, represents about the oldest type of existing quadrupeds. In the Post-Pliocene period the correspondence between the existing and extinct faunas is still further increased through the large preponderance of recent species. On the border-line of this and the preceding period we meet with the earliest unequivocal remains of man himself.

The correspondence between the recent and extinct mammalian faunas may be conveniently summarized as follows:

Post-Pliocene period

Mammalia principally of living species.

Pliocene period

Mammalia principally of recent genera — living species rare.

Miocene period

Mammalia principally of living families — extinct genera numerous; species extinct.

Eocene period

Mammalia with numerous extinct families and orders. With two or three exceptions, all the genera extinct. Species all extinct.

I appeal to the facts before you, and ask, Could there be a more beautiful demonstration of the rise and fall of a fauna tending in the direction of general succession? Do we not see in the wreck of the past faunas the roots of the fauna of our own day, and can we close our eyes to the evidence of development that is here presented to us? A skeptical mind may, however, still urge that this is but a fortuitous succession, and that we have failed to bring forward proof of such transformism as will permit us to see that the modern groups which succeed the more ancient ones are necessarily developed from these. But proof in this direction is by no means wanting. When we trace back the histories of some of our existing groups of animals we find that the characters by which they are defined become less and less marked, until they are almost completely lost, when the group as such disappears. In other words, the specialized animals of to-day, or rather their representatives, become more and more generalized as we trace them back in geological time. Thus, the Carnivora lose much of the true type of carnivore structure in the early part of the Miocene period, and by almost insensible modifications pass off into a group of animals, their immediate forerunners in the Eocene period — the Creodonta — which combine about equally the characters of the Carnivora with those of the Insectivora. Thus, the Creodonta stand intermediate between two of our modern groups which are seemingly very far removed from one another. In the same way, if we take some of the more prominent families of the Carnivora, the bears and dogs, for example, we find that their special structural features like-

wise disappear — the bears becoming less and less bears, and the dogs less and less distinctively dogs, until we meet with an animal, the Amphicyon, which is about as much the one as the other. Similarly, the cats become less and less cat-like, and they can be traced down to animals which on the one side link them to the civets, and on the other, to the dogs.

Again, the large group of the lemurs, those singular representatives of the Quadrumana which impress such a distinct individuality upon the fauna of Madagascar, become less and less lemurine the farther back we trace them, approximating very closely to the type of insectivore structure. So complete is this approximation that the most experienced zoologists are at a loss to determine in many cases whether certain ancient types are in reality lemurs or insectivores. Other animal groups likewise converge toward this same group of the Insectivora, which (or certain immediate allies) are now considered to represent the stem from which most of the existing placental mammals have been developed. We thus see how unstable are the characters which have been formulated toward the proper delimitation of animal groups. The beautiful classification of Cuvier, which was founded on the assumption that the living organisms represented are the only types known to nature, is no longer applicable in the sense it was intended by its illustrious promulgator, and it is vain to plead the individuality or want of convergence of animal groups.

Proofs of Individual Variation

But let us press the inquiry still further, and within a narrower sphere. I have thus far treated of the relations of the different higher groups of animals, the limitations of which may not be very clear to the non-scientific mind. But where, the skeptical mind may ask, are the proofs of individual variation, of variation in special organic structures? I will attempt to lay before you some of these, and take my first illustration from the class of fishes. In the vast majority of the ordinary bony fishes, as is well known, the tail is nearly equally divided into two lobes, and is said to be *homocercal*. In sharks and rays, as represen-

...es of the cartilaginous fishes, on the other hand, the tail ... typically unequally lobed, and is said to be *heterocercal.* ...s, as might have been expected, seeing that the sharks repre... a comparatively low ichthyic type, is also the case with the ...liest fishes, with both sharks and ganoids, and not till an ...rmediate middle period do we find a tendency on the part the tail toward homocercality. A large proportion of the ...rassic ganoids are provided with the modern form of tail, ...d these, again, are preceded by a form, Semionotus, in which ... tail is of a distinctively transitional character.

As pertaining to the group of reptiles I can present to you ... equally beautiful and conclusive case of the modification special structures. The crocodiles represent a fairly ancient ...oup of reptiles, beginning with the Triassic period of time; ...e recent genera date from the period of the chalk. In their istory they present a remarkable series of developmental hanges. In the modern crocodiles, and in those of the later ...retaceous period, two series of bones belonging to the roof ...f the mouth, known as the palatines and pterygoids, are so lisposed as to form the boundaries of the posterior nostrils; ...n the crocodiles that preceded these, or those of the early Cretaceous and Jurassic periods, only the palatines are produced to form these nares; and in the still earlier and earliest forms, those of the Triassic period, neither the one bone nor the other is concerned in the structure of the parts in question. Correlatively with these changes other modifications, scarcely less significant, mark the rise of this very remarkable animal group. Thus, the earlier crocodilian forms retain a primitive character in the biconcave form of the vertebræ — a structure belonging primarily to the lowest group of vertebrates, the fishes. This structure is replaced in the Cretaceous period by the cup-and-ball, or procœlous vertebra, which is also the type of the Tertiary and modern forms.

The History of the Horse

Other instances of similar variation and progression could readily be cited, but my limited time will only permit me to dwell upon a few very striking cases drawn from the class of

mammals. The history of the horse furnishes, perhaps, the most complete series of structural modifications which permit us to trace the ancestry of an animal in very nearly its minutest details. The chart before you indicates these modifications in a series of horse-like animals which carries the line of descent of our modern animal back to the Eocene period, and to an animal so very different, that were it known by itself alone, it would be classified by zoologists, not only as a species distinct from the modern horse, but as a distinct genus, representing an entirely different family, and even a wholly different sub-order. The connecting ties, however, absolutely establish the serial line of progression, and indelibly mark the pedigree. The history of the European horse is almost as complete as that of the American, but remarkable though it may appear on any but an evolutionary hypothesis, its first ancestral forms include an animal different from any of the earlier equine progenitors of the New World, and one that holds equal claim to being the true progenitor of the tapir and tapiroid animals. This is the Palæotherium, several species of which, ranging in size between the deer and horse, have been described, and whose remains from the early Tertiary strata of the Paris Basin furnished the material for one of the classic memoirs of the illustrious Cuvier.

The modifications here referred to are primarily the greater or less differentiation of the elements of the foot and leg (fore and aft). In the modern horse there is but a single toe to each foot, which is supported by a single metapodial (cannon-bone), but in the more ancient horse-like animals the feet were polydactyl in character, being furnished with three, four, or even five toes. This is seemingly a broad difference, and it might reasonably be supposed that there must exist strong grounds for uniting animals that appear so widely removed from one another. The *rationale* of our classification is the fact that between the earliest horse-like animals and the modern horse we have a series of transitional forms which show almost every grade of foot structure leading from polydactylism to monodactylism, the toes undergoing gradual reduction in number, and (excepting the single toe that is retained) growing smaller in size as we proceed from the more ancient to the more

modern forms. This gradation is beautifully illustrated in the chart before you, where the supernumerary, and to an extent functionless, toes of the Eocene Hyracotherium, which is followed by the less and less distinctively polydactyl forms of the Oligocene, Miocene, and early Pliocene periods, are seen to be represented in the later Pliocene Pliohippus and the recent horse (Equus) by a simple pair of "splints" attached to the cannon-bone. Beyond the Hyracotherium we have still a full five-toed animal, the Phenacodus, which is now generally recognized as the earliest known progenitor of the horse tribe. Correlatively with the progressive changes in the structure of the foot, there are equally well-marked modifications in the disposition of the bones of the arm and leg, and in the form and complexity of the grinding teeth, which are also illustrated on the chart before you.

That some of these modifications belong as well to the horse as a specific animal as they do to the horse as a tribe, is conclusively shown by the circumstance that we even now occasionally meet with living horses possessed of more than one toe to the foot, and, indeed, it has been affirmed — although the statement still lacks full confirmation — that the embryo horse is polydactyl. These are important facts bearing upon the developmental history of the animal.

Cameline Animals

The cameline animals, especially those of the New World, present a connecting series or chain almost as complete as that which has been established for the horse. The existing animals of this group, in common with other ruminants, have the bones of the middle-foot (the metapodials) united into a single "cannon-bone," as in the deer, but they differ strikingly from all other members of the broad group which they represent in possessing a pair of incisor teeth in the upper jaw. By some naturalists the absence of superior cutting teeth in the ruminants has been supposed to stand in direct connection with the development of horns, but just in what manner has not been definitely determined. It is, however, an interesting circumstance, that the cameline forms, almost alone among ruminants,

are entirely destitute of horns, while they possess the peculiar dental character above referred to.

In following back the ancestral line of these hornless ruminants we can detect a series of very remarkable and gradual modifications which connect the modern animal with animal forms very unlike itself. Thus, in one of the earliest members of the cameline series, the Oligocene or Miocene Poëbrotherium, whose species appear to have had the slender and graceful proportions of the modern gazelles, the metapodial bones were distinct, and the mouth was furnished with a complete series of incisor teeth. This distinguishing dental character is retained in the succeeding Protolabis (Middle Miocene), but whether or not the metapodials were united into a single cannon-bone is still unknown. In the Upper Miocene Procamelus, whose forms ranged in size intermediate between the sheep and camel, the incisor teeth have been reduced to the normal number found in the camels, although the premolars still conform to the formula 4/4, instead of 3/2, which distinguishes the genus Camelus. An intermediate position between Procamelus and Camelus is held by the Pliocene genus Pliauchenia, which possesses but three premolars in the lower jaw, while nearly the extreme term of reduction in this part of the dental series is found in the late Pliocene and recent llamas (Auchenia), which retain but two premolars in the upper jaw and a single one in the lower jaw. Finally, in the nearly contemporary genus Holomeniscus, which embraced animal forms fully equalling the camel in size, and ranging from Oregon to the valley of Mexico, there is but a single premolar left to each side of either jaw.

The eliminative development that has here been traced corresponds very closely with the conditions presented by the living animal in passing from its embryonic to its adult condition. Thus, in the fœtal condition of probably all ruminants the metapodial bones are distinct, as in the early Poëbrotherium; moreover, the animals are provided with cutting teeth in the upper jaw, in the manner of their ancient progenitors. Professor Cope, who has given close attention to the study of the development of the cameline race, further shows that very young camels have the additional premolar of Pliauchenia, and that

this tooth is shed at an early period, very rarely persisting for any length of time. Similarly, the anterior premolar of the normal camel is found in the young llama, but it is dropped long before the animal attains maturity.

Modification of Certain Organs

The investigation of the causes which have wrought these remarkable changes in the animal frame constitutes more properly a part of zoological or physiological inquiry, and I can but briefly refer to the modifications as resulting primarily from the interaction of mechanical forces. The use and disuse of parts must necessarily have a direct bearing upon their ultimate development, and similarly the manner of use must largely influence the manner of growth of such parts. These are conditions known to us in our every day experience but, owing to the very limited time over which our direct observation extends, we are generally able to detect only minor changes, and miss the grander effects which are dependent upon the action of time. The swift-footed animal, which in the process of rapid locomotion elevates the body so as to weight it principally upon the extremities of the toes, leads the way to the gradual disuse of those toes which, in the required position, are no longer able to give support to the body; hence, a consequent degeneration, and the formation of those apparently "accessory" and more or less functionless toes which we see in the hog and many other animals. Similarly, the necessity for a rigid frame combined with lightness would tend to bring about a consolidation of those bones, like the metapodials, whose independent action may now no longer be required. The character of the food supply, necessitating definite methods in the way of eating or mastication, must have a direct effect upon the masticating apparatus, and conduce toward the formation of the special dental structures which are distinctive of the different animal groups.

Perhaps no more beautiful illustration of the special modification of a certain organ or structure can be found than that exemplified in the development of the deer's horn. Everyone is aware that in our ordinary deer with branched antlers the process of growth is a regular and successive one. Before the

first shedding we have a single solid horn; after this shedding a single tine is developed; then a second, and a third, until we have the complicated structure of the typical antler. Now, precisely this system of progression can be traced in the geological history of these animals. In the early cervine animals of the Middle Miocene period, as has been so clearly stated by Professor Boyd Dawkins, the horn is a simple forked crown; in the Upper Miocene it becomes more complex, but is still small and erect, as in the roe; in the Pliocene it becomes larger and longer, and altogether more complex and differentiated, some forms, such as the Cervus dicranios of Nesti, having the most complicated antlers known either in the living or fossil state. Seeing this steady progression in the complication of the antler, it might naturally be expected that were we to trace this development backward we should gradually come upon a zero of complication, and that eventually the horn would completely disappear. And this is precisely what we find to be the case. The earliest cervine animals, or those of the Lower Miocene period, are absolutely hornless, and the series is thus made complete. The question naturally arises: Are these earliest hornless forerunners of the true deer deer or antelopes? The fundamental distinction between these two groups of animals lies in the fact that the horns of the antelope are hollow, instead of solid, as in the deer, simple, instead of branched, and that they are not periodically shed. But if there are no horns present, how are we to determine, in the absence of these distinguishing characters, the actual position of the animal under consideration? This is a problem that does not admit of ready solution; indeed, there is a strong probability that the hornless animals of the Lower Miocene period were ancestral to both deer and antelopes, a dual development starting out, just as we have seen to be the case with many other animals, in diverging directions. The high probability of this dual development is forced upon us, apart from all other considerations, by the remarkable case of prong-horn of the western plains, which is a hollow-horned ruminant, to all intents and purposes a true antelope, yet with divided horns, whose sheaths are periodically shed, in the manner of the shedding of the horns of the deer.

The deer have quite recently furnished one of the most in-

teresting examples of a connecting form, or so-called missing link, in an animal exhumed from the swamps of northern New Jersey, which stands intermediate between the stag and elk. This relation is made clear by the figures of the skulls of the three species which are placed before you. In the stag, it will be observed, the skull is high, and shows but little of that anterior attenuation which is such a distinctive feature of the skull of the elk. The nasal bones of the former, again, are remarkably long when compared with the similar bones of the latter, and the premaxillaries, instead of being projected forward along the horizontal plane of the base of the skull, are deflected sharply downward. In all these points, it will be seen, the newly discovered form (Cervalces) holds an intermediate position. The skull exhibits a partial attenuation anteriorly, the premaxillaries are directed about equally downward and forward, and the nasal bones are measurably contracted in size. The horns likewise furnish characters which further serve to establish this dual relationship.

Development of Intellect

There is still one phase of development which remains to be considered — the development of intellect or brain force. Although seemingly an intangible subject, geology affords evidence in regard to it fully as important as that which attaches to the development of bone or muscle. No absolute relationship has as yet been determined to exist between the size of the brain and mental capacity, the latter being largely, or even principally, dependent upon the quality of the brain material, but, in a general way, it may be admitted that the larger the brain in proportion to the body, the greater will be the amount of brain force generated by it. Using this most legitimate standard as a basis for comparison, we are brought to an astonishing result when a study is made of the brains of the earlier animals, the outlines of many of which have been as perfectly preserved as the casts of the interiors of shells. From this study it appears that all the Tertiary mammals had comparatively small brains, and that there has been a gradual increase in the size of the brain mass from the earlier to the

later parts of this period, the increase being almost wholly confined to the cerebral hemispheres. In the earlier forms — indeed, until late in the Tertiary — the hemispheres left the cerebellum entirely uncovered, and the olfactory lobes were correspondingly largely developed. The brain was, in fact, more nearly reptilian in character than mammalian. The series of diagrams before you illustrate the development of the brain in certain mammals of the Tertiary period more or less closely connected in their ordinal relations.

It will be seen from these figures that the relative size of the brain in the older mammalian types was small when compared with that of the forms which successively followed them. In some of the Dinocerata, which were by far the largest of the Eocene Mammalia, nearly equalling the elephant in size, the brain was so small that it could have been passed through the neural arches of the lumbar or sacral vertebræ! In relative size this diminutive brain, which is proportionately the smallest brain known among mammals, whether recent or fossil, is surpassed by the brains of many reptiles. Hoplophoneus oreodontis, one of the sabre-toothed cats, although of about the size of a panther, had a brain no larger than that of the domestic cat. The peculiar sulci or gyri seen on the dorsal aspect of the brains of modern mammals were also largely absent in the earlier forms, or were disposed longitudinally, instead of transversely, as we find them in the lowest of recent placental mammals — the rodents, edentates, and insectivores. The same law of cerebral development which is here indicated for the Mammalia is also applicable to reptiles and birds, and in probably equal degree. I have placed before you a drawing of one of the largest of the dinosaurian reptiles, the Jurassic Brontosaurus, an animal measuring probably fifty feet in length, yet in which the weight of the entire skull does not appear to have exceeded that of the fourth vertebra of the neck.

Geological Formations and Faunal Antecedents

Before dismissing this part of my subject I must direct your attention to one phase of the inquiry which is as well geographic as it is geologic in its scope. It is a familiar fact that

the different parts of the earth's surface are to-day characterized by distinct faunal associations. Thus, we recognize a South American fauna as distinguished from an African, a Eurasiatic fauna as distinguished from an African or Australian, and so on. Now if, as is contended by the upholders of organic evolution, our existing faunas have been developed from their immediate faunal antecedents, we must have some indication or foreshadowing in the latest geological formations of the faunal characters which, in a broad way, serve to distinguish the several zoogeographical regions. And this is precisely what we find. You have already learned that in the earlier Tertiary periods of mammalian history the existing animal forms were almost wholly different from the forms of to-day, and that they became less and less different as we approached the modern era. But with this distinctness there appears to have been more of a general correspondence between the faunas of the different parts of the earth's surface, so that the zoogeographical boundaries which we now recognize could at best be only partially drawn. It is only in the Post-Pliocene, or latest Tertiary, period that the approximation between the past and recent faunas has been so far established as to permit us to trace clearly the existing zoogeographical relations, and to state that the modern fauna has been sketched out in place. Thus, in the Australian Post-Pliocene marsupials Diprotodon, Nototherium, Thylacoleo, and their allies, we have the forerunners of the various marsupial forms that now characterize the continental fauna; in the giant birds Palapteryx, Dinornis, Mionornis, etc., from New Zealand, Dromæornis from Australia, and Æpyornis from Madagascar, the forerunners of the wingless apteryx and the struthious birds from the same or neighboring regions; and in the giant South-American edentates, Glyptodon, Megatherium, Mylodon, and their allies, the representative, if not the ancestral, forms of the existing sloth, armadillo, and ant-eater.

III

There has been much speculation, and no less controversy, during recent years, concerning the birthplace and origin of man, and I don't know that we are any nearer the solution of

these questions than we were immediately after the publication of Mr. Darwin's "Origin of Species," nearly thirty years ago. That man is a descendant of some two-legged and two-armed creature much like himself, although less hominine both in the development of his intellectual faculties and the structure of his bodily frame, there is little reason to doubt, but science has thus far failed to make known this earliest and much looked for preadamite. I am not prepared to share the enthusiasm of certain French archæologists who recognize in a number of very ancient "chips" or "flints" the handiwork of apes, and in these last the missing progenitorial tribe (Anthropopithecus); for although the reputed facts may be true — and I am far from denying that they are true — some further evidence is needed before they can be confidently accepted as facts pure and simple. Nor can I fully appreciate the evidence which carries his antiquity back to the earlier portion of the Tertiary epoch. I fail to find satisfactory proof of man's belongings having been found in deposits very much (if at all) older than the Post-Pliocene, although not unlikely some such will yet be discovered of far more ancient date; but a sharp line must be drawn between actualities and probabilities.

In our own country the finding of the "most ancient remains" of man has from time to time been reported, but I am not aware that in any case these remains can be proved to be older than the remains found in different parts of Europe; indeed, in most cases they appear to be much younger. The implements from the "Trenton" gravels of the Delaware, if actually belonging there, would seem to indicate an antiquity dating from the glacial epoch, and probably nothing beyond this can be definitely located. The famous Calaveras skull, from the auriferous gravels of California, is still too much involved in obscurity to permit of its being used in positive evidence; nor can much dependence be placed upon the calculations which have been made to determine the age of the man of Florida, which was discovered by Pourtalès upwards of thirty years ago. I have the pleasure to lay before you this evening two human vertebræ, which I obtained two winters ago from a semi-compact ferruginous sandstone on Sarasota Bay (west coast of Florida), and which our distinguished President,

Professor Joseph Leidy, has kindly determined for me to be probably the last dorsal and first lumbar. The vertebræ, it will be observed, are of iron, there having been a complete substitution of the bony material by iron-hydroxide (limonite), but with an absolute retention of the structure distinctive of bone. Many of the other bones of the skeleton were still associated with these vertebræ, but with limited facilities at my command I was only able to procure these two fragments. How old they may be I am not prepared to say; unfortunately, their geological position was such as not to permit of a clear determination of this point. Apart from the cast of an unknown form of coral found in a neighboring and similarly placed stratum, paleontology furnishes no clue to the solution of this interesting problem. But that the age is very great, the condition of fossilization fully proves; and I think it may be safely held that the vertebræ in question represent the most ancient, or very nearly the most ancient, remains of man that have thus far been discovered. But beyond this it would be dangerous to venture.

Modification of Invertebrate Types

We have thus far confined our attention exclusively to a consideration of the higher groups of animals, the Vertebrata. The lower or invertebrate animals present equally striking proofs of modification and transformism, but the limited time at my command will permit me to bring before you only one or two special cases, drawn from the class of Mollusca, with which my own investigations are connected. If the doctrine of evolution holds true, it stands to reason that, as in the case of higher animals, the existing fauna must be foreshadowed in the fauna of a period immediately preceding; this connection cannot generally be established, owing probably to migrations and intermixtures of different faunas, as depending upon changes in the physical condition of the surroundings. In the sheltered region of the Gulf of Mexico, however, a fauna appears to have been developing in place for probably hundreds of thousands of years, so that the unequivocal ancestors of many of the living forms can be found in the fossil remains that preceded them. I have brought before you several such forms, which it was my

pleasure to discover two winters ago in the interior wilds of the peninsula of Florida.

One of these you will readily recognize as a wing-shell, of the type of the large pink conch which is found on so many of our mantel tops; I have named the species, in honor of the distinguished President of this Academy, *Strombus Leidyi*. Alongside of it I have placed the stromb most nearly related to it in the recent fauna, *Strombus accipitrinus*, an inhabitant of the Floridian and West Indian coasts. In comparing the two together it will be seen that the principal distinguishing characters lie in the particular form of the wing, and in the tuberculation of the body-whorl or chamber, but these differences are so well marked as to obscure at first sight the relationship. In the majority of the fossil forms the wing is more or less evenly crescentic in outline, whereas in the recent species it is markedly quadrangular in its upper moiety, so much so that in extreme specimens the outline is wholly different from that seen in the fossil. But *Strombus Leidyi* shows a pronounced tendency to vary in the direction of *S. accipitrinus*, and conversely the latter, in this regard, seems to vary equally in the direction of the former, so that we have an almost perfect gradation established between the extreme wing-structures seen in the one species and the other, or between the almost perfectly crescentic outline and that which exhibits the greatest quadrangulation. In a similar manner the very prominent tubercles seen in the recent species, which are represented by elongated nodes in the fossil, are more or less lost in some individuals, although they at all times appear more prominent than in the fossil; on the other hand, the nodose ribs of the fossil frequently tend in the direction of tuberculation, thus again bridging the interval between the two species. We have step by step all the intervening gaps filled in between the two species, and in such a manner as to leave no doubt concerning the interrelationship of the forms in question. It is interesting to note in this connection that no individuals of the recent form occur in the deposits containing the fossil species, which, as an inhabitant of the seas immediately preceding the present one, may very reasonably be looked upon as the immediate progenitor of the stromb of the modern Gulf.

In the case of the other two forms which I have brought before you, the fossil crown-conch (*Melongena subcoronata*) and volute (*Voluta Floridana*), we have similar or analogous details of structure which unite them with their living representatives (*Melongena corona, Voluta Junonia*). Thus, the first-named is distinguished from the common crown-conch of the Gulf by several well-marked characters, of which the deficiency in the number of tubercles to the different whorls, and the horizontal position occupied by them, are especially apparent. The tubercles are also more compact, and do not show the foliaceous or scaly character which they exhibit in the living species. But while these differences in structure readily serve to distinguish the typical or most abundant forms of the two species, they in a measure fail when some of the less typical forms are taken by way of comparison. Thus, a tendency toward increase or duplication in the number of tubercles is here and there apparent in the fossil form, while, *per contra*, a tendency toward deficiency is not exactly rare in the recent species. Similarly, the tubercles or nodes of the fossil, which in the typical forms stand out nearly horizontally from the shoulder of the shell, or have but a moderate inclination, are occasionally more nearly directed in the position occupied by the tubercles of *M. corona;* conversely, in many of the less typical forms of the latter there is a close approximation to the condition found in *M. subcoronata.* In this manner the two species are inseparably bound together. As in the case of the stromb, so in this instance also, no trace (or at best but a doubtful one) of the recent Melongena has been found in the deposits containing the fossil; nor, on the other hand, have any traces of the latter been found in the modern seas, so that we may here also plausibly assume that the one form is the forerunner and probable progenitor of the other.

The fossil volute differs slightly in outline from the rare living species of the coast, and is further distinguished from it by its more acute apex, and the greater prominence of the costal ornamentation on the apical portion of the shell. These differences, although not very great, nor seemingly of much consequence, are yet persistent, and as such may be considered of sufficient value to characterize a distinct species. But despite

these differences it is impossible not to observe the very close connection which unites the two forms, and I must admit that on first finding the fossil I almost unhesitatingly referred it to the recent species (*Voluta Junonia*), and only after a careful comparison of actual specimens of the two species was I able to discern the permanent differences between the forms in question. Yet so fully convinced was I of the ancestral relation binding together the two that I did not hesitate, even in the absence of all color-markings, to pronounce the one as the all-probable progenitor of the other. Other specimens that have since come to me prove the correctness of my surmise, since these very clearly show the peculiar and beautiful color-markings which belong to *Voluta Junonia*.

Ancestral Forms of Living Species

I also place before you two series of conch-shells of the group to which the pear-conchs (Fulgar and Sycotypus) of the New Jersey coast belong, which the fossil fauna of Florida has permitted me to complete. They range back in time from the present era to the Miocene, or possibly even a still older, period, and comprise each some four or five hitherto described species and two or three new forms which are now for the first time brought to light. In other words, they represent some six or seven distinct species of systematists, yet so closely do they grade one into the other that it is impossible to define the individual limits, and they may be properly considered to represent one true or varying type. Is not this a remarkable instance of specific variation and origination, or is it merely a matter of blind coincidence?

It might very naturally be contended that in assuming the Pliocene fossils here represented to be the ancestral forms of some of the living species the assumption is in the nature of a thing taken for granted, and that no reasonable proof has been presented indicating the necessary changes from the extinct to the recent faunas. And were no further evidence presented than that which is embodied in the three shells under consideration, the objection taken would be allowed full weight. But when it can be shown, as can very readily be done in the

...hat the Pliocene Paludian fauna, which is ... the fauna immediately preceding the present ...ves many of the forms that are now living, ...rs that are strictly representative of although ...h living forms; and further, that some of the ...rombs, exhibit a remarkable tendency to variation ...rent modification, the objection loses all force, ...tinctly opposed to the interpretation of fact and ...e. Manifestly, palæontology can offer no direct ... transmutation beyond that which a common-sense ...n of facts will allow. But the evidence is approximate the same nature as that which permits us to interpret ...e proportion of the phenomena about us without our ...e to perceive the workings of such phenomena.

Discoveries in Tertiary Lake Basins

...annot conclude this chapter on molluscan variation without referring to the very remarkable discoveries which have been ...e during the last few years in some of the later Tertiary basins of Germany and Austria, bearing upon the modification, through time, of the characters of certain well-known ...shwater genera of mollusks. The so-called 'Paludina beds' Slavonia, which date from about the middle Tertiary period, will best illustrate my purpose. From these deposits, which ...in continuously from what are known as the 'lower' to the upper Paludina beds,' and whose physical development appears to have been practically uninterrupted, Professor Neumayr, of Vienna, has brought to light a number of forms, eight or more, of Paludina, which differ so materially from one another that to the casual observer they appear like so many distinct species; and as such have they actually been described. But it has been shown that the divergences through which the different forms have been brought about are clearly continuous and progressive; in other words, that the modification is a gradual one, leading up from the oldest fossil form of the basal series to the newest from the top bed. This is one of the completest cases of transformation known in the animal kingdom."

XVI

THE VARIETY AND METHODS OF HIS WORK

Even before Mr. Heilprin's return from Martinique he was sought as a speaker by various associations. In Baltimore he gave lectures at the Peabody Institute and at the Johns Hopkins Club. When such requests to speak came to him the thought of compensation never influenced him in his response. He always maintained that it was the duty of the scientist to give of what he knew regardless of pecuniary reward. He had hardly settled down to his work at the Sheffield School in New Haven when he began to organize free public lectures on scientific subjects in New Haven, and it was his delight to learn that there was a demand for them. The thought of what these efforts cost him never entered his mind. All his life he gave freely of his time and advice, and not seldom of his slender means, to those who seemed to have a claim on them. He was a prodigious worker and counted not the hours of day and night when a certain task was to be accomplished. Yet he would say, with apparent perfect sincerity, that he had never done a hard day's work in his life. He was never hurried, never appeared in low spirits. When he unbent, he did so completely, and he could spend his occasional vacations in seeming idleness and search of pure frolic. He was ready, at all times, to do a service to his fellowmen, and his sympathies embraced all animate nature. He would never hunt or kill an animal, and never used firearms on any of his expeditions.

Though apparently in good health, he was never robust, but his rather slight frame seemed to be equal to the physical exertions he so often underwent. Probably the task of re-editing Lippincott's New *Gazetteer of the World*, which, together with his brother, he undertook in 1901 and carried to its conclusion

in 1905, in addition to all his other labors, involved too severe a strain, as unquestionably did the experiences in Martinique which interrupted that task. He seems to have had, even earlier, premonitions of an abrupt termination of his labors, though he never expressed them to his relatives. There was such a suggestion in a letter to a friend, Mr. George F. Parker, at the time U. S. Consul at Birmingham, in which he said, under date of October 1, 1895:

"At irregularly recurring intervals your name rises up before me as that of one who is different from the regular grade of 'humanity,' and oftentimes do I recall with pleasure our Atlantic and home associations. Only last week at our home in Summit, did we comment upon your resolve to go to Germany to study English as something standing up in particular relief against the commonplaces of the *reformed* or *new* education.

My object in writing just at this time is to revive and renew thoughts of mutual interest, taking advantage of a little lull in my scientific work and appointments. I have just returned from a trip to the Rocky Mountains, where I had guided a portion of my geological class. It was my first visit to that section of our great country, although, as you doubtless recall, I had before been pretty well through Mexico. My report on Mexican Explorations is almost ready for publication, but probably before putting it to press I shall again visit our sister republic. My fondness for travel seems to increase with age, and not impossibly I shall leave this world on the top of some mountain pinnacle or among Arctic glaciers. Mr. Peary has just returned unsuccessful — an issue which I deeply deplore. Of all intrepid men there are few who are his superiors.

I also contemplate an early visit to Europe — the first since my return with you — and possibly I may join with it the feature of lecturing in popular courses at one or more English institutions. This suggestion is, I believe, your own; at any rate, I recall your reference to possible lectures at the Mason College.

Seemingly my reply to your letter of over a year's standing never reached you, or at least no intimation of such a receipt

has ever come back to me. Indeed, I do not now even recall what I then wrote.

Science and modern thought have lost heavily in the death of Huxley — a man whom I place front in the very front rank of intellectuality. I do not know his equal among the living today." . . .

Whatever misgivings as to the state of his health Mr. Heilprin may have had at various times, his outward bearing gave no evidence of it. He always impressed those with whom he came in contact as a man of extraordinary vitality. When he returned from his first expedition to Martinique a writer in the Philadephia *Press* said of him:

"For a man approaching fifty years of age Professor Heilprin is wonderfully active. That is the reason why he got to Martinique in May so soon after the first eruption.

He does n't wait to look after details of personal affairs when a scientific matter requires attention. He gets a barometer, a thermometer and other instruments which he shall need during his exploration, and with these and a camera he is off.

It is related by some of his friends that they were actually surprised when before leaving on his first journey to Martinique he bade them farewell. To lose sight of him and then hear that he had been to some faraway clime on an exploration tour was not a new thing to them, and when he considered his visit to Martinique sufficiently full of peril to warrant saying good-bye they awoke to full appreciation of the horrors going on in that island.

Professor Heilprin moves and thinks with great rapidity. When he talks it is very quickly. Though the test has never been made it is safe to say that he would make the fastest stenographic reporter ask for a moment to breathe. He is not anxious to tell all he knows, but once, when he is ready to talk, he can dictate an interview with astonishing quickness, never losing the thread of the subject in irrelevant matter.

Reporters who have interviewed him agree that he is a wonder among those whom it is a journalist's lot to meet. . . .

With all the honors that have come to him he is a plain, unassuming man, and one who meets him upon the street would not gather from any action of his that he is one of the most daring and one of the most celebrated of American scientists."

When he returned from British Guiana he was a sadly changed and suffering man. He realized the seriousness of his condition. Informed by a physician that his heart was badly affected, he remarked to his brother and the present writer, with a smile: "He told me nothing new. I have known that I had some heart trouble ever since I ascended Vesuvius, thirty years ago." Yet during all the intervening period he had, obeying the call of duty as he saw it, scaled mountain after mountain and undergone exertions that would have taxed the strongest constitution. Like the true scientist he was, he was also a brave soldier of humanity.

He bore the dreary months of suffering with quiet fortitude, deriving, until near the end, enjoyment from the reading of novels for which his busy life had left him no leisure. He was, in a measure, grateful for this experience, and often expressed his pleasure to his brother and his sisters. Of *Vanity Fair* he spoke with unbounded admiration. The end came suddenly.

A word ought to be said of his veneration for the great men in science who were his ideals and, in a sense, his models — Humboldt, Darwin, and, among the living, the distinguished Austrian savant, Professor Eduard Suess. Dr. Joseph Leidy, with whom he was in close contact, he considered the most many-sided and accomplished scientist in this country.

XVII

HEILPRIN'S VIEWS ON THE CORAL REEF PROBLEM

Angelo Heilprin's own place in the ranks of the explorers and naturalists of his generation is secure. Among his many contributions to science one of the most noteworthy is his discussion of the coral reef problem, in which he upheld Darwin's subsidence theory (*The Bermuda Islands*). The chapter deserves reproduction in this place.

"In view of the peculiar conditions attending coral growth — the limitation of depth to 100 or 120 feet — the difficulty of accounting for the occurrence of coral structures in some of the deepest parts of the sea at once becomes apparent. It had, indeed, been assumed that coral islands merely occupied the summits of submerged volcanoes, and that their distribution over the deep-sea was simply an indication of the existence, in the region in question, of an equal number of buried volcanic peaks or mountain backs. Recent researches have, however, failed in the majority of cases to detect the presence of such hypothetical buttresses rising to within a few feet of the surface, but, on the contrary, tend to show that at least in some instances the actual coral portion of the island descends of itself hundreds, if not thousands, of feet into the ocean.

The genius of the late Mr. Darwin has furnished a theoretical explanation of the phenomenon which, even if it cannot be held to be proved or conclusive, has at least the merit of a strong probability in its favor, and of being in consonance with well-determined geological facts and conditions. This 'subsidence' theory, which until recently received the almost unanimous support of geologists, is based upon the evidence of extensive terrestrial movements, and presupposes the existence

of numerous land-masses rising from the deepest water. Around these, under favorable conditions, reef-building and other corals would flourish in abundance, the submerged cone affording a suitable base for the development of the coral animal. The external margin of the coral barrier or buttress, which may be assumed to grow from a possible depth of 120 feet, owing to the invigorating action of the beating surf, and an increased food-supply, would probably rise more rapidly than the inner parts, whose development would also in a measure be checked by the out-pouring of detrital sediment. A shelving inwardly-sloping collar or bank, having a land-nucleus in its center, would thus be produced. In the ring thus forming, whose outer margin, through the breaking and heaping action of the sea, would be lifted somewhat above the general water-level, we have the skeleton of the future atoll. We may now distinguish three elements in its construction: the outer ring or collar of coral, the central nucleus of land, and the encircling body of water which separates the two.

The Atoll

If at this stage of its formation we conceive the enclosed island to undergo a slow and gradual subsidence the following phenomena may be assumed to present themselves. The outer border of the reef would slowly but steadily build itself up to the level of the water, the growth of the coral colony keeping pace with the gradual sinking of its substratum, provided this be not too rapid. The parts sinking below the line of 120 feet would die out, and their future purpose would be merely to afford a base for the super-structure. The island portion, on the contrary, would sink deeper and deeper, until eventually it might completely disappear. We would then have an outer barrier and an inner lagoon, with probably one or more communicating passages between the latter and the sea cut through the coral growth. This is the typical atoll.

The Barrier Reef

When a reef is separated by a considerable body of water from the adjoining land it is termed a 'barrier' reef, of which

two distinct types, the 'encircling' and the 'linear' barrier reef, are recognized. An encircling barrier reef differs mainly from an atoll in that the assumed subsidence has not been sufficient to completely bury the enclosed island, leaving consequently, no internal sea, but merely a separating channel formed within the coral boundary. By further subsidence, it is conceived, the encircling reef would be converted into an atoll. When a coral boundary extends for a great distance in a more or less linear direction it is termed a linear reef, or "barrier" reef proper. The great barrier reef off the island of New Caledonia extends in a N. W. and S. E. direction for a distance of upwards of 400 miles, and that of the northeastern coast of Australia has a linear extension, with interruptions of more than 1000 miles. In the case of the latter the width of the intervening strait is in many places between 50 and 60 miles, with a depth of water reaching 350 feet. The reef patches, themselves, even in their broader parts, rarely exceed one or two miles in width.

The Fringing Reef

Besides the three forms of coral structure — atolls, encircling and barrier reefs — which have been assumed to give unequivocal evidence of subsidence, there is still a fourth type, that of the so-called 'fringing' reef, which has generally been considered to afford proof either of terrestrial stability or of actual elevation. These fringing reefs hug the immediate shore line, and may, indeed, be said to represent the incipient stage or starting point whence the other forms of reefs were developed; by slow subsidence a fringing reef would, on the Darwinian hypothesis, be converted into a barrier reef. Fringing reefs are frequently continued as a series of superimposed terraces above the dry land, — an unequivocal proof of elevation. They rarely, if ever, descend in the water to depths much exceeding 120 feet, and, as might be naturally supposed from their manner of formation, are but rarely associated with the other forms of coral reefs.

Applying the Darwinian hypothesis of subsidence to the phenomena of coral structures generally, we may deduce the

following: A region of atolls, encircling and barrier reefs is primarily a region of subsidence — of subsidence now actually taking place, or only recently completed; *per contra,* regions characterized by fringing reefs are regions either of stability or of slow and gradual upheaval. The greatest area of indicated subsidence is that of the Central Pacific, which has been assumed to compass a tract measuring 6000 miles in length and 2000 miles in greatest width. Commencing at the Paumotu group, or the Low Archipelago on the south-east, and extending to the Carolines on the north-west, the coral structures dot at intervals the surface of the sea for a linear distance of 100 degrees of longitude, embracing in this space several hundred true islands, besides numerous reefs of one form or another. In the Paumotu group alone there are, according to Dana, not less than 80 atolls.

The Theory of Simple Coral Upgrowth

The existence of such an enormous subsidence area as is involved in the Darwinian hypothesis is necessarily difficult to realize, and, indeed, numerous apparently valid objections seem to interpose themselves to its full acceptance. It has been shown that within, or immediately on the border of, the supposed subsiding area there occur local tracts where fringing reefs take the place of atolls, and, again, others where raised coral patches or terraces clearly indicate elevation. The coral on some of the Hervey and Friendly islands is stated to occur at a height of 300 feet above sea-level; on the island of Guan, one of the Ladrones, according to Quoy and Gaymard, the coral rock is in places fully 600 feet above the sea. In some island groups, as Hawai, Feejee, etc., coral structures apparently indicative of both depression and elevation occur interassociated among the different islands constituting those groups, and the same feature — the interassociation of fringing and barrier reefs with atolls — has been observed by Semper in the Pelew Archipelago (West Pacific). This condition, together with various concomitant difficulties that lie in the way of the Darwinian hypothesis, has led to the rejection by many naturalists — Semper, Guppy, A. Agassiz, Murray, Geikie, and

others — of the subsidence-theory, and to the substitution for it of a theory of simple coral upgrowth, with structural modifications as depending principally upon currental action and food-supply.

This theory, like its alternative, presupposes as a first necessary condition of coral growth the existence of a submarine basement within the zone of coral life (1–20 fathoms). Upon this, which may be the buried slope or the summit of a volcano, or merely a bank, the coral animal develops and builds to the surface. Where such a sub-structure does not immediately exist, or rather does not extend to the zone within which reef corals are limited, it is claimed that suitable foundations may be obtained through the building up of submarine volcanoes by the deposition on their summits of organic and other sediments. This would explain the apparent anomaly of coral structures rising from depths vastly exceeding the lower boundaries of coral growth, a condition which to Mr. Darwin necessitated the assumption of subsidence. It is well known that throughout the greater mass of the ocean there is a constant rain or down-pouring of organic particles in the form of the calcareous and siliceous tests of Foraminifera, pteropods, diatoms, etc., much of which goes to form the vast accumulation of white mud (Atlantic or Globigerina ooze) which covers the greater part of the oceanic floor. Manifestly, such an accumulation must eventually acquire great thickness. It is more than doubtful, however, if any very considerable thickness of such deposit has been built up during the existing period of coral growth, or that an accumulation of this kind has materially aided in building up the sub-coral buttresses of the deeper seas. The investigations of Mr. Murray, deduced from data obtained by the 'Challenger,' indicate that a column of oceanic water of 600 feet depth, with a transverse area of one square mile, contains some 16 tons of suspended organic particles; these, if precipitated to the floor of the sea, would make a deposit 1/10000 inch in thickness. It has thus far been impossible to determine the duration of life of the organisms furnishing the organic particles, mainly Foraminifera, and consequently there is no direct way of ascertaining in what period the tests of a given column of water are replenished.

But manifestly, there can be no more rapid accumulation of the calcareous ooze than there is lime-carbonate suspended in the sea; and again, the quantity of lime-carbonate so suspended must depend upon the quantity of the formative material contained in the sea — the quantity of lime carried in by the rivers, and any residual or surplus quantity that might be already existing. Now, it would seem from careful observation made on many of the most important rivers of the globe that the quantity of lime carried out by them into the sea annually is about one-sixth that of their suspended sediment, which would cover the sea-bottom, if precipitated at a rate proportional to that of the removal of continental sediment — one foot in 3000 years — to a depth of about 1/4500 inch. Assuming that one-half of this amount is used by the Foraminifera for the construction of their shells, the rest being taken up by the mollusks, corals, etc., then the foraminiferal accumulation from this source would be the 1/9000 part of an inch annually, or very nearly the amount that would accumulate from the droppings contained in the 600-foot column of water, as deduced from Mr. Murray's determination. At this extremely slow rate of accumulation, it would require a period of 100,000 years to build up the thickness of a single foot! Naturally along coast-lines, where the molluscous animals largely contribute to the general growing mass, and where inorganic sedimentation is unusually brisk, the process of upgrowth may be comparatively rapid, especially in the trend of powerful oceanic currents. A condition of this kind seems to obtain along the Floridian coast, and it is not unlikely, as has been suggested by A. Agassiz, that the Florida banks have been built up largely in the manner above described. But the conditions become very different when the oceanic abyss, such as the central Pacific, is substituted for a comparatively shallow coast-line. Indeed, even in the case of the Floridian banks it is doubtful if most of their upgrowth is not really due to bodily uplift rather than to organic and inorganic accumulation, as we have most conclusive evidence of an uplift in the peninsula of Florida in a period at least as late as the Pliocene. Nor are evidences of a more recent contrary movement wanting in the same region.

Objections to the Theory of Slow Accumulation

It will, however, naturally be urged against this assumption of slow accumulation that the quantity of the salts of lime already contained by the sea is vastly in excess of that which is annually thrown in by the rivers, and that, therefore, the amount of formative material on hand is amply sufficient to meet all the exigencies of a rapid growth. The quantity of calcium actually contained in every cubic mile of sea-water is estimated to be nearly 2,000,000 tons, while that held by an equal volume of river-water is less than 150,000 tons. At the rate of the present carrying capacity of rivers it is calculated that it would require 680,000 years to pour into the ocean an amount of calcium equal to that which is now held by it in solution. The question here naturally presents itself: To what extent is this surplus quantity of lime drawn upon by the oceanic organisms for the construction of their hard parts or skeletons? It is in the nature of things impossible to give a direct answer to this question, but the following considerations suggest themselves. As far as our knowledge permits us to pass beyond the region of facts, we can but assume that the salinity of the sea is progressive or cumulative, and not the reverse, and that the saline constituents of ocean water are primarily the products of destruction arising from the wear and tear of the land-surface. There seems to be no good reason for supposing that the quantity of salts in the sea, and of lime especially, was ever much in excess of what it is to-day, unless it was near the beginning of geological time; on the contrary, there are some grounds for concluding that this quantity may have been less, and even considerably less. If this conception is true, it is manifest that, as far as organic consumption of lime is concerned, there is either existing stability in the sea, or that the different shell-bearing animals remove less of the formative material for their own purposes than the sea receives from continental erosion. In the calculation before made we have used as a basis merely the quantity of lime-carbonate carried out in solution by rivers; to this must necessarily be added that which is derived directly by the sea

through its own breakages — the wear of the coast-line — and the other salts of lime of which no account has been taken. If we double the quantity that has been assumed we will probably more than cover the available supply; a rate of accumulation, therefore, of one foot in 50,000 years would be the result. It is needless to say that such a slow accumulation is hardly compatible with any notion of growth from great depths, and that it is entirely opposed to the view which holds to the formation of giant banks leading up to the zone of coral life.

Theories of Alexander Agassiz

But in what, it might be asked, lies the direct evidence that giant banks are being built up through organic accumulations? Is it merely the finding of foraminiferal and pteropod ooze on projecting knobs of the ocean bottom? This is not a new condition, and it is practically repeated in the Globigerina ooze which covers much of the oceanic floor. It would, indeed, be remarkable if such deposits did not exist, but their presence gives no answer to the possibility of building up giant banks under the conditions which would be considered necessary for the making of coral islands. No one has more carefully studied, or is better acquainted with, the Florida reefs than Alexander Agassiz, and perhaps no class of reefs has been more frequently appealed to in the recent discussion of coral structures than those examined by this authority. We are informed by Mr. Agassiz that these reefs are merely organic growths and accumulations, whose present positions, whether of horizontal or vertical distribution, have practically no connection with recent movements either of elevation or depression. 'There is practically no evidence that the Florida reef, or any part of the southern peninsula of Florida which has been formed by corals, owes its existence to the effect of elevation; or that the atolls of this district, such as those of the Marquesas or of the great Alacran Reef, owe their peculiar structure to subsidence.' On what evidence, it might be asked, rest these assertions? It may not be easy to prove subsidence in the case of the Marquesas and the Alacran Reef, but I believe it would be equally difficult to prove the reverse proposition — *i. e.*, that there has been

no subsidence. As far as the Florida reefs themselves are concerned, I believe the evidence is all but conclusive that they owe much, if not most, of their existence to uplift, and to uplift within a recent geological period. My own researches in the southern part of the peninsula have demonstrated the existence of Pliocene deposits in vast horizontal, or nearly horizontal, beds as far south as the Caloosahatchie, and there can be no question that these deposits, which rise to 10 or 15 feet above the level of the sea, are continued for some distance still further to the south. The same deposits, moreover, are capped by deposits of Post-Pliocene age, proving that an uplift took place in this region as late as the Post-Pliocene period. That this uplift should not have affected the apex of the peninsula, and even the reefs beyond, seems scarcely credible. From what we now know of the structure of the Floridian peninsula it is clear that this portion of the North American continent represents a comparatively old chapter in geological history, and that it has passed through much the same phases of construction as the border area of the Eastern and Southern United States. Its periods of elevation and depression, extending back through the greater portion of the Tertiary epoch, were largely coincident with those of the regions above indicated, and the movements were with little doubt long sustained, and certainly affected large areas at a time. There is nothing, as far as I can see, to indicate that these movements were confined to what is now dry land; the more natural conclusion is that the axial or plateau uplift extended much beyond the limits of the present peninsula, and as well southward as westward or eastward. The similarity in the geological structure of Yucatan, as it appears from our present knowledge, lends weight to the supposition that the area thus affected by movements was perhaps continuous completely across the Gulf.

Objections to the Subsidence Theory

In explanation of the distinctive form of atolls — the ring of coral with its inclosed lagoon — it is claimed by the opponents of the subsidence theory that coral plantations building up from submarine banks will grow more rapidly on their outer

margins, where the food supply is the greatest, and where, as compared with the inner parts of the mass, there is less obstructive sediment, and thus an exterior rim or elevation would be formed. The differentiation of the inner and outer parts, it is assumed, would be further intensified by the removal in solution of the lime-carbonate from the less active interior portion — the region of coral decay and detrital accumulation — and the formation there of a shallow pan of water or lagoon. That the distinctive features of an atoll may be brought about somewhat in the manner here described can scarcely be doubted; indeed, the supplemental atolls of diminutive size that so frequently accompany the large reefs, the serpula-reefs of the Bermudas for example, convincingly prove the possibility of ring structure without subsidence. But in instances of this kind the ring is merely a narrow projection, barely rising above the shallow central depression, and is due probably more to the action of a beating surf than to any other cause. In the case of a true atoll with a large lagoon the conditions are very different, and it seems impossible to explain the central depression, often 20, 30, and 40 fathoms, or even more, in depth, on the assumption of internal solution, aided by external acceleration as dependent upon an increased food supply. It does not appear exactly clear why solution should progress more rapidly within the lagoon than over the deeper slopes of the coral buttress, where the protective power of the living animal is also wanting; nor is it at all likely that such solution as actually does take place within the lagoon more than compensates for the accretion of sedimentary material derived from the destruction of the surrounding shores, or for the organic accumulation that is continuously forming along the floor of the lagoon.

Accumulation as a Prevailing Condition

My examination of the Bermudas convinces me that, as far as those islands are concerned, the quantity of lime removed from the interior waters is far less than that which is added through sedimentation and organic development. The bottom is everywhere covered with fine debris, and the even floor

indicates that this debris is of considerable thickness. One has but to gaze upon the undercut and crumbling ledges of Harrington Sound and the cliffs facing the lagoon to be convinced that accumulation, and not solution, is the prevailing condition in these waters. Yet we have here a depth of water of from 50 to 80 feet. I am, indeed, far from convinced that the organic accumulation which is here taking place by actual growth does not far surpass the material removed through solution. The tests, both perfect and fragmentary, of Foraminifera are abundant everywhere, but in addition to material derived from this source, there exist large areas which are seemingly well covered with the shells of molluscous animals (Chama, Arca, Avicula, etc.) and sea-urchins (*Toxopneustes variegatus*). The latter, with *Arca Noæ*, are especially abundant. The coral growth of Castle Harbor, and not less the insular patches of millepore, etc., in the big lagoon, speak with sufficient emphasis on this point. There can be no doubt, too, that some of the basins and channels have been recently shallowing through silting, but of course this may have been brought about through a mere transference of material from one point to another. The depth of water in the Flatts Inlet, which receives a strong tidal current from the outer lagoon and from Harrington Sound, is much less to-day than it was in the early part of the century, when the Inlet furnished a safe anchorage to vessels of large draught.

Mr. Bourne finds similar conditions to exist in the lagoons of the Diego Garcia reef, and he entirely rejects the theory that lagoons could have been primarily formed through solution. He shows that nowhere has the lagoon deepened since the time when Capt. Moresby surveyed the region in 1837, but, on the contrary, evidences of shoaling to the extent of a full fathom on the south side are not wanting. It is also pointed out that the depth of water in the lagoons of the various islands which are associated with Diego Garcia is not proportional to the size of the lagoon, as we should naturally expect to find it in accordance with the theory of solution. This is also true of the Bermudian waters, although their relations somewhat differ from those of the Chagos Banks. Thus, the depth of water in the comparatively small Harrington Sound is

measurably greater than that of the outer water, the big lagoon; it is also much greater than we find it in the superficially more extensive Castle Harbor.

The Solvent Power of Sea-Water

Experiments made to determine the solvent power of sea-water show that the process of solution is a very slow one. It appears indeed incredible, in the face of such energetic solution as is presumed to exist in the upper waters of the ocean, that any extensive organic accumulation could ever take place over the floor of the sea, where the solvent power of the water is materially increased through pressure, and still less possible that any considerable foundation could be built up from it, or from the summit of only a moderately depressed mountain peak. The fact that in so large a number of atolls the lagoons are either entirely wanting, or are reduced to mere shallow pans of water, also militates against the hypothesis of solution.

With regard to the formation of the primary ring through accelerated growth on the outer margin, as depending upon an increased food-supply, it may be reasonably doubted if this condition could obtain in the open ocean away from a land area, inasmuch as by far the greater quantity of the food-supply would be given to the polyps as a direct down-pouring from above, and independently, or nearly so, of any currental action. It is true that the outer polyps or colonies would be favored by having an extra supply on their exposed borders, but this would tend probably in the majority of cases only to lateral extension, or to lateral extension combined with upward growth — in other words, to a simple turbinated growth with a nearly flat top. It is true that in a few instances, as has been noted by Semper and Darwin, colonies of Porites, having a turbinated form, exhibit a raised border or lip, but it is equally true that in by far the greater number of cases the individual larger colonies assume either a clavate or a hemispherical form, the latter condition being also distinctive of the giant brain-corals. Mr. Bourne, from his researches on the Diego Garcia reef, also dismisses the notion that food-conveying currents are especially instrumental in shaping the reefs, and he points

out that frequently the most elevated side of an atoll is turned away from such currents, and, again, that a large number of coral islands are placed entirely to one side, or out of the path, of the prevailing ocean current.

The True Energy of Coral Growth

But even granting that through some method of accelerated growth on the exterior an elevated bounding ring should be formed, the difficulty in accounting for the existence of the deep lagoon would in no wise be lessened; for, in the first place, no such ring would be formed below the line of coral growth, and we should consequently be compelled to assume as antecedent to its formation the complete upward growth or elevation of the submerged bank to the true coral zone, or to a greatest possible depth beneath the surface of 100 or 120 feet. Manifestly, under such conditions there could be no deep depression corresponding to lagoons of 200 or 300 feet depth, unless these were subsequently formed by means other than solution. Furthermore, it appears that the true energy of coral growth is concentrated in the first zone of some fifty or sixty feet, which would practically mark the depth at which a bounding rim of accelerated growth would be formed, and also fix the depth of the lagoons. But as has already been seen, the depth of nearly all extensive lagoons is very much greater, in some cases six times as great, or more.

Darwin's Theory of Subsidence

The difficulty in the premises disappears almost entirely if we accept Mr. Darwin's hypothesis of subsidence, for here the accelerated outer growth is assumed to depend no less upon interior retardation (as the result of the accumulation of injurious sediment), as upon an actual increase in the quantity of the food-supply. The depth and size of the lagoon will then depend upon the extent of land that has undergone subsidence, and upon the measure of its submergence. Where the descent is very gradual the upward development of the coral structures may by overgrowth completely close out the lagoon; where, on the other hand, the descent is unusually rapid,

more rapid than the compensating upward growth of the corals, a "drowned" atoll may be the result. The great Chagos Bank, which is situated some 700 miles to the south of the Maldives and has a length of about 90 miles with a greatest width of 70 miles, has generally been assumed to be only a completely submerged or drowned atoll. If raised to the surface it would be in the form of a true atoll, with a depth of water in the lagoon of 40–50 fathoms. At the present time the bounding reef is covered with water of from 4 to 10 fathoms depth. The Bermuda Islands have also been instanced as an example of a partially drowned atoll, but, as has been shown in the preceding chapter, there is nothing in the present land-mass to indicate that it bears any direct relation to an atoll ring.

Objections to the Theory Considered

An objection that has been frequently urged against the subsidence theory, and one that has been more particularly insisted upon by Guppy as the result of extended observations made in the Solomon Islands, is that where fringing reefs are exposed they usually exhibit only a moderate thickness of true coral-rock, the basement or sub-structure being mainly of a pelagic character — that is, built up of the remains of pelagic animals (Foraminifera, etc.). Hence, it is argued that in the so-called subsidence reefs — atolls and barrier-reefs, — the actual thickness of coral is very limited, or barely more than that which would fall within the regular zone of coral growth. The few observations that have been made on this point, cannot be considered to throw much light upon the question, the more especially as the evidence obtained is far from corroborative. Furthermore, it is just in such elevated reefs that in accordance with the Darwinian theory we should frequently look for a thin deposit of coral-rock, for if there has been elevation instead of subsidence the thickness must necessarily be slight; when, however, subsidence had preceded elevation the result would be the opposite. No weight should be attached to the oft-repeated assertion that in the older geological formations there are no really massive reef-structures. This assertion is entirely opposed to the facts, to cite but a single instance

presented by the Dolomites of the Tyrol, the reef-structure of which has been so ably worked out by Mojsisovics and others. Furthermore, it is practically impossible in the case of a large number of the altered limestones to state whether they are of coral origin or not.

One objection against the subsidence theory has still to be considered. It is the association of fringing reefs with atolls. This commingling of two distinct types of structure, implying movements in opposite directions, has been much commented upon, and placed under strong emphasis by the adherents of the new views regarding the formation of coral islands. But the occurrence appears to be entirely without significance. An alternate movement of elevation and subsidence is no more strange over an oceanic area than it is on the continental borders. Yet we have here almost everywhere evidences of a differential movement, and no geologist has for a moment expressed surprise at the manifestation. What then is the anomaly of the occurrence of such movements in a coralline sea? How is the conception of subsidence antagonized by the facts of elevation? If we conceive of an atoll, with a deep lagoon, once having been formed through subsidence, what is to prevent a succeeding elevation from lifting parts of this atoll, or for that matter, the entire atoll-ring, above the water? We could still have the lagoon of subsidence retained, and yet as a last record of movement we would have merely the evidence of elevation. Because a certain structure is formed through subsidence it does not follow that this subsidence should not be followed by elevation. This is but the order of things we find everywhere expressed in the history of continental masses. Indeed it would be but natural to look for local oscillations in regions of extensive movement. Mr. Bourne lays great stress upon the evidences of elevation (of a few feet) which are presented by Diego Garcia, and claims them to be conclusive against 'the idea of any subsidence being in progress, as Mr. Darwin fancied to be the case in the Keeling atoll.' I confess that I can find nothing in this evidence which would preclude an assumption of subsidence sufficiently recent to have produced the characteristic atoll form. We have in the elevated beach-rock of the Bermudas unequivocal evidences of elevation,

but equally conclusive are the evidences of the subsidence which followed this elevation. In other words we have here the conditions of Diego Garcia simply reversed. Again, in regions where, as in that represented by the great Chagos Bank, it might be assumed that 'drowned' atolls have been formed as the result of too rapid subsidence, a change of movement would be all but certain to develop reefs of elevation in combination with those which are assumed to bear in their structure the evidences of subsidence. In other words, there would be an interassociation in the same archipelago of both fringing reefs and atolls, for it can scarcely be conceived that all the projecting land-masses of the archipelago could, at the time when movements of one kind or another set in, have been equally elevated above, or depressed beneath, the surface of the water. Hence, unequal developments must have taken place.

Views of Modern Physicists and Geologists

Such are the principal circumstances connected with the history of coral islands. If the theory of subsidence cannot, perhaps, be considered to be absolutely demonstrated, it accords best with the facts, and, indeed, may be said to be in substantial harmony with them. Furthermore, it helps to explain the significant fact, first pointed out by Dana, that a very large, if not the greater, number of coral structures are ranged along the line of greatest depression in the sea.

The question here naturally suggests itself: Is there any evidence supporting the theory of assumed subsidence of the oceanic basins beyond what is furnished by the coral islands? It must be admitted that our positive knowledge on this point is very limited — indeed, almost nothing. But various considerations lead to the belief that the present site of the oceanic basins is a very ancient one, and possibly one that has not materially changed, except in so far as intensification is concerned, since it was first marked out as the most prominent feature of the earth's crust. While manifestly we can have no proof of this condition, it seems but reasonable to assume that if this vast depression was formed through an early flexure of the crust, and as the result of weakness in certain parts of that

crust, it has retained its position of depression from the first. With a contracting or moving crust, moreover, particularly under the special conditions of loading (sedimentation) and continental unloading (denudation), it is likely that a depression of this kind would tend to sink or to subside, and force a relief from strain in the uplift of the continents. This is the view now held by probably the greater number of physicists and geologists. But it does not carry with it the assumption of a necessary permanence in the positions of continents and oceans; it does not imply that the oceanic basins were originally of the extent that they are to-day, as we are led to believe by many geologists. It is far more probable that the existing dimensions have been brought about through progressive or cumulative subsidence, which has gradually swept away land-masses that at one time occupied some of the present area of the sea. The long lines of ridges which have been revealed to us by deep-sea soundings, and the placing on these of many of the oceanic islands (volcanic peaks), together with the evidence which the past and present distribution of animal life carries with it, all support this conclusion. It seems, indeed, impossible to account for the existence of oceanic (volcanic) islands, or for the negative islands which rise as prominences from the oceanic floor to within a comparatively short distance of the surface, except on the assumption of subsidence. What is the significance of buttresses like St. Helena, Ascension, the Caroline Islands, or the giant peaks of the Sandwich Islands rising from depths of two or three miles, or more? Can it be assumed that they have been steadily built up volcanically from the ocean floor, four or five miles in height? This is, perhaps, not impossible, but it hardly appears probable. Vulcanism in one form or another doubtless manifests itself over the floor of the ocean, but all indications point to a comparatively limited action in the greater depths. Were submarine eruptions at all numerous, or of that intensity which might be assumed to be necessary for the construction of a giant mountain-peak, we should be probably made aware of their existence in a manner not less emphatic than in the case of subaerial eruptions. It might be assumed that the long intervals at which eruptions take place would prevent

special notice of such phenomena, and that, consequently, their effects, even if most momentous, would be placed practically beyond observation. But this is not likely to be the case. When we consider the large number of peaks that in one form or another come to, or beyond, the surface, and realize how few of them are in a condition of activity, it is difficult to believe that many of these peaks are to-day in a course of volcanic construction, or that other submarine peaks, scattered between these, are undergoing a similar process of formation. It seems far more natural to assume that these peaks or islands have been for a long time fully formed, and that they were formed at a time when their relations to the surrounding sea were more nearly those which govern the positions of by far the greater number of the active volcanoes of to-day. In other words, they were probably continental or sub-continental, and their present positions are the indices of continental subsidence; the vast mass of overflowing water may have extinguished the fires that at one time supplied the material for eruption.

New Submarine Peaks

The recent discovery of a large number of submarine peaks, whose existence had not previously been even surmised, rising to within a comparatively short distance of the surface, seems to support the general conclusion of subsidence. The soundings of telegraph ships indicate that between the latitude of Lisbon and the island of Teneriffe there are not less than seven peaks over which the depth of water varies from not more than 12 to 500 fathoms. From the entire oceanic basin it is claimed that there are already known about 300 such "submarine cones, rising from great depths up to within depths of from 500 to 10 fathoms from the surface."

Probably the greatest difficulty that lies in the way of the acceptance of the subsidence theory of coral structures is the fact that there are not more islands which are in a condition of semi-formation — *i. e.*, peaks, partially submerged and surrounded by an encircling barrier reef. This is not an insuperable objection, and might be treated by some geologists

in the nature of negative evidence. But the fact is of significance, and must be taken into account for whatever it may be worth, in all theories bearing upon the formation of coral islands.

A Prominent Opponent of the Subsidence Theory

Since the preceding notes were sent to press Alexander Agassiz has published his observations on the 'Coral Reefs of the Hawaiian Islands.' This paper, apart from giving detailed descriptions of the reefs of the Sandwich Islands, presents, on the whole, perhaps the clearest statement of views bearing upon the structure of coral islands that has yet been published, but it can scarcely be said that it contributes materially toward the solution of the general problem. Mr. Agassiz asserts himself to be a pronounced opponent of the theory of subsidence, as, indeed, he has always been since he first undertook the very careful survey of the Florida reefs. I think it will be generally admitted, however, that the evidence which is now brought forward is, as far as the substitute theory is concerned, almost wholly negative, while much of it favors the theory of subsidence. Mr. Agassiz assumes certain definite premises or propositions, which are dogmatically stated, but it is difficult to find the exact evidence upon which these premises are based. The special points of evidence which, in the opinion of this authority, render the subsidence theory unnecessary and untenable are practically the same as those which have already been discussed, and consequently they call for but little detailed consideration.

Mr. Agassiz considers it 'remarkable that Darwin, who is so strongly opposed to all cataclysmic explanations, should in the case of the coral reefs cling to a theory which is based upon the disappearance of a Pacific continent, and be apparently so unwilling to recognize the agency of more natural and far simpler causes'; and he further expresses himself: 'as long as we can in so many districts explain the formation of atolls and of barrier reefs by other causes, fully sufficient to account for the numerous exceptions to the theory of Darwin, which have been observed by so many investigators since the days of Darwin and Dana, it seems unnecessary to account for

their presence by a gigantic subsidence, of which, although we may not deny it, we can yet have but little positive proof' (p. 131). These reflections are well so far as they go, but have the 'natural and far simpler causes' underlying the formation of coral reefs, which are to take precedence over the Darwinian hypothesis, been satisfactorily demonstrated? I believe not, and I further believe with Dana and Von Lendenfeld that no facts that have yet been brought forward stand in direct opposition to the theory of subsidence. Mr. Agassiz assures us that the 'Mosquito Bank, the Yucatan Bank, and the smaller banks between Honduras and Jamaica, are all proof that limestone banks are forming at any depth in the sea, or upon pre-existing telluric folds or peaks, constituting banks upon which, when they have reached a certain depth, corals will grow' (p. 133), and a similar condition is considered to underlie the formation of the Florida reefs. It has, however, *not* been shown that these banks have been actually built up in the manner that has been described, or that any other banks have been similarly reared from really great depths. The assertion that the Florida reefs have not been assisted in their upward growth by elevation (p. 142) is, as far as I can see, not supported by fact, for we have in the regular horizontal limestone beds of the southern part of the peninsula the most conclusive evidence of elevation even as late as the Pliocene and Post-Pliocene periods, and there is every reason to believe, even if the condition cannot be proved, that this upward movement did not stop short of the coral-forming tract. Nor does this movement of elevation preclude the possibility of subsidences having taken place coincidentally in the same region. It appears to me by no means certain that the deep channel now separating the apex of the peninsula of Florida from Cuba, and known as the Straits of Florida, was really cut by the Gulf Stream, as is maintained by Mr. Agassiz. It seems to me far more probable that it, as well as some of the other deep channels separating the West Indian Islands, was formed through subsidence — the result of localized breakages in the crust. This view has already been expressed by Suess, who draws a close parallel between the physiographic construction of the basin of the Gulf of Mexico and that of the Mediterranean.

Differing Views of the Opponents of Darwin's Theory

Mr. Agassiz thinks it 'somewhat surprising that, in the discussion which has lately been carried on in the English reviews by the Duke of Argyll, Huxley, Judd, and others, regarding the new theory of coral reefs, no one should have dwelt upon the fact, that, with the exception of Dana, Jukes, and others who published their results on coral reefs soon after Darwin's theory took the scientific world by storm, not a single recent original investigator of coral reefs has been able to accept this explanation as applicable to the special district which he himself examined' (p. 133). This condition may be surprising, but it is not less surprising that the different investigators who have rejected the Darwinian hypothesis should have thus far failed to agree among themselves as to their own special theories. Thus, the 'solution theory' of the formation of the atoll-lagoon, which has been so much emphasized by Mr. Murray, and the possibilities of which we have already discussed, is practically rejected by Bourne, Guppy, and Wharton, and even Agassiz expresses himself not fully satisfied with its efficiency. And as far as I know no satisfactory explanation of the formation of the deep lagoons has been given by any of these investigators. Captain Warton has recently described a number of submerged reef-structures in the China Sea which have a deep flat centre, surrounded by an elevated growing rim; it is assumed that were this rim to grow up to the surface we would have the characteristic features of an atoll, with its deep central lagoon, presented. But there is no evidence to show that these submerged atoll-like banks are not really banks of subsidence, rather than of upward growth, and in their general features they do not differ from the Chagos Bank which Mr. Darwin considered to represent a half-drowned atoll. Until a satisfactory explanation is furnished of the origin of these central lagoons, so long must any theory bearing upon the formation of coral structures be considered merely tentative. In the case of the Bermuda Islands, which limit the field of my own investigations in this direction, I am confident that, whatever may have been the

original construction of the region, the present lagoon features have been brought about through subsidence; and this conclusion was reached before me by Professor Rice, who seems to have been amply satisfied with the subsidence theory!

On one point in connection with his recent survey Mr. Agassiz furnishes important testimony, and that is as to the actual thickness of the coral-made rock, or, at least, the depth beneath the surface at which this rock occurs. This has been determined by the artesian borings made in the vicinity of Honolulu, and elsewhere. At various points the bore pierced coral-rock at depths of 100–500 feet beneath the sea-level. In the well of Mr. James Campbell, near the Pearl River Lagoon(?), 28 feet of white coral was struck at a depth of nearly 1000 feet below high-water mark (p. 153), and again at 'Waimea, Oahu, 900 feet was drilled through hard ringing coral rock' (p. 152). In these facts, however, Mr. Agassiz sees no evidence of subsidence. He prefers to account for the great thickness of the coral rock 'by the extension seaward of a growing reef, active only within narrow limits near the surface, which is constantly pushing its way seaward upon the talus formed below the living edge. This talus may be of any thickness, and the older the reef, the greater its height would be, as nothing indicates that in the Hawaiian district there has been any subsidence to account for such a thickness of coral rock in its fringing reef' (p. 154). But where are the evidences which support this explanation? I must confess that I fail to see any. The assumption of a seawardly-extending talus of coral is, it appears to me, purely gratuitous. Indeed, with the very gentle slope that these islands have beneath the sea it is extremely doubtful if any extensive talus could accumulate as a result of either downflow or downwash. Professor Dana has well supplied the argument on this point, and it seems to me that it is unanswerable. With a gradient of perhaps eight degrees, and not impossibly much less, it is almost inconceivable that there should be much lateral spread of detached coral boulders. Neither wave-action nor the action of the oceanic currents, except possibly under conditions of earthquake disturbance, would be likely to effect the required displacement.

Again, it might be asked, what kind of direct evidence must

we look for to establish the point that there has been no great progressive subsidence in the Hawaiian Islands? The needed evidence is just of that kind which it pleases the Earth to keep to herself, and after which the geologist has in most instances sought in vain. The fact that cinder-cones are found 'with their base close to the present sea-level' proves, it appears to me, nothing in this connection, and I fail to see the argument which draws from their existence a proof of non-subsidence. But Agassiz himself admits that there is 'some evidence of subsidence [about 50 feet] on the southern shore of Hawaii' (p. 154).

Facts in Corroboration of Darwin's Theory

On the whole, it seems to me, that the facts as they are presented are, if they indicate anything at all, directly in favor of subsidence, and of subsidence on an extensive scale. They are in my mind far more conclusive than the somewhat similar facts which have been generally accepted by geologists to prove depression or subsidence in delta-deposits, such as those of the Mississippi or Ganges. Dr. W. O. Crosby, in his paper on 'The Elevated Coral Reefs of Cuba,' shows that the coral limestone of Cuba is in places at least a thousand feet in thickness, and he naturally infers that there must have been subsidence to nearly this amount. Mr. Agassiz, commenting on this important observation, says (p. 150, *note*) that it does 'not throw any additional light on Darwin's theory of subsidence; it is of the same character as all the statements which prove the subsidence by the existence of coral reefs, and while there may have been coral reefs formed during subsidence, it does not prove that their growth is due to subsidence any more than the presence of elevated reefs proves them to be due to elevation.' This criticism is in a measure valid, but it must be remembered that one of the 'strong' points urged by Guppy and others against the subsidence theory was the (supposed) non-existence of massive deposits of coral-limestone, or such as indicated formation through protracted subsidence. But here we surely have such a limestone (provided the observation is correctly made), and its presence removes

what might have been a valid argument against the Darwinian hypothesis. And further, there is reason to believe that the thousands of feet of reef-structure which have been described by Sawkins in Jamaica are largely, if not mainly, of coral growth, and represent a formation produced during a long period of subsidence.

In the foregoing discussion of the structure of coral reefs, as also in the chapter treating of the physical history of the Bermudas, I have used the term 'subsidence' (and necessarily its opposite — elevation) in a relative sense, indicating a depression or submergence of the land beneath the sea. But whether this submergence was due to a positive movement on the part of the land, or to a change of level (rise) in the water, cannot readily be determined, as the phenomena attending either form of movement would be practically identical. The broad problem of oceanic transgression and continental stability, which has been so forcibly outlined by Suess, cannot be properly treated in this place."

Angelo Heilprin's views concerning the origin of coral reefs were considered a weighty reinforcement of Darwin's theory. They are thus referred to by Francis Darwin, in the Life of his father (Mr. Darwin quotes from Professor Judd's "Critical Introduction" to a new edition of his father's *Coral Reefs and Volcanic Islands*, etc.):

"During the last five years, the whole question of the origin of coral reefs and islands has been re-opened, and a controversy has arisen, into which, unfortunately, acrimonious elements have been very unnecessarily introduced. Those who desire it will find clear and impartial statements of the varied and often mutually destructive views put forward by different authors, in three works which have made their appearance within the last year — *The Bermuda Islands*, by Professor Angelo Heilprin; *Corals and Coral Islands*, new edition by Professor J. D. Dana; and the third edition of Darwin's *Coral Reefs*, with Notes and Appendix by Professor T. G. Bonney."

A Summary of his Achievement

A critical estimate of Angelo Heilprin's scientific achievements is beyond the ability of the present writer, but the value, to his generation, of what he did and what he was cannot be doubted.

Nowhere, perhaps, was the lesson of Angelo Heilprin's life summed up so well as in the lines penned by one close to the family, in an editorial article in the Baltimore *News:*

"The life of Angelo Heilprin was remarkable not only as that of a distinguished naturalist, a man of comprehensive learning, and an explorer of intrepid daring, but perhaps even more as a life lived in the calm pursuance of the man's individual ideals of living. The ordinary rewards of successful achievement, scientific or other, had for him no compelling attraction, no power to swerve him from the path which his love of nature, his passion for knowledge, and his serene philosophy laid out for him. Not even the privileges and immunities of a university professorship would have been compensation, to his mind, for the independence of action and of movement which, as a scholar and investigator unattached to any institution, he felt able to command. Though always dependent on his own earnings for a livelihood, he found in the occasional results of literary labors and of special lectures enough to satisfy his modest needs, and he declined tempting opportunities for making connections which would have carried with them both honor and profit. We hear much talk of 'the simple life,' but we seldom see an exemplification of it such as is given by the life of a man of splendid endowments, of superb energy, of extraordinary powers of work, who goes serenely on his way as did Heilprin, ignoring the allurements of those rewards which are, with the generality of men, the constant object of anxious endeavor. The lectureship at Yale which he recently accepted, occupying his time two or three months a year, was the nearest approach to a permanent fettering tie that he ever assumed.

There were two things that gave to the career of Angelo Heilprin a distinguishing character. One was the combination of a passionate love of nature, its beauty and grandeur, with an ab-

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Part III

LOUIS HEILPRIN

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LOUIS HEILPRIN

I

HIS EARLY LIFE

In his essay on Joseph Joubert, a wise Frenchman not yet sufficiently known to the general reader, but appreciated in his day by Diderot and D'Alembert, Matthew Arnold says:

"It began to be remarked of him that M. Joubert '*s'inquiétait de perfection bien plus que de gloire* — cared far more about perfecting himself than about making himself a reputation.' His severity of morals may perhaps have been rendered easier to him by the delicacy of his health; but the delicacy of his health will not by itself account for his changeless preference of being to seeming, knowing to showing, studying to publishing. . . . 'He has chosen,' Chateaubriand (adopting Epicurus's famous words) said of him, 'to hide his life.'"

What is true, in this characterization, of Joubert, is also true of Louis Heilprin. Barring a serious weakness of the eyes, which shut out from him much of the world of objects visible to normal sight, it could not be said that he had delicacy of health, but he had all of Joubert's delicacy of soul, and he chose to hide his life, though few lives were nobler.

The existence of such extraordinary knowledge as Louis Heilprin possessed could not, however, be wholly hidden from discerning minds. In an obituary article on him in the New York *Evening Post,* the writer said, after speaking of his "unrivalled comprehensiveness and accuracy of knowledge throughout a large part of the domain covered by encyclopædias," and his collaboration with his father in the revision of the American Cyclopædia:

"While the work done by Mr. Heilprin was chiefly in this line, his intellectual powers in other directions were, if anything, even

more remarkable, though these were known only to a small circle of friends. His extraordinary modesty and a certain shrinking, due partly to the circumstance of his extreme near-sightedness, held him back from activities of the highest kind, for which his mental endowments fitted him. He was always intensely interested in all matters relating to engineering and transportation, and had a penetrating grasp of such questions as that of rapid transit in New York. At a critical time in the discussion of this question, he sent to one of the leading engineering journals an elaborate article on the subject, which so impressed the editor that he urged Mr. Heilprin to make further contributions to the magazine, never doubting that the article came from the pen of an engineering expert. But a much rarer power was that which was shown in his remarkable grasp of the fundamental principles of theoretical mechanics, obtained without any systematic study of the subject. He had no mathematical education beyond the elements of algebra, geometry, and trigonometry; but, becoming somehow interested in the parabola, he deduced the radius of curvature of that curve by reasoning essentially identical with that which underlies the processes of the differential calculus. Indeed, his analytical power in many domains of thought, including political economy, was as remarkable as his prodigious and accurate memory for facts."

Louis Heilprin's life was as uneventful as his brother's was rich in stirring incidents. He was born in Miskolcz, Hungary, July 2, 1851. His early years in this country were spent in the closest communion with his brother. They received the same scant instruction in the public schools of Brooklyn and Yonkers and shared the same tastes. As a boy, Louis was as fond of books on natural history as was Angelo, and he had the same talent for drawing and for turning his mechanical skill to account in contrivances of one sort or another. There is still in existence a set of chessmen, of the usual size and appearance, which the two boys carved out of wood. Owing to the weakness of his eyes, which early manifested itself, Louis was never able to read more than a few minutes at a time. Until late in life, all his reading, which ranged far and wide, and much of his writing, was done for him, generally by his sisters. That his memory, excellent by inheritance, was sharpened by the need

of concentrating his attention on what was read to him, there can be no doubt, and occasional peeps into grammars, for a few minutes at a time, served for the rapid acquisition of the structure of many languages. When, after years of such desultory studying and strained listening, he, at the age of twenty-two, took his place at the side of his father in revising the American Cyclopædia he was a ripe scholar in the fields of history and geography, with a keen logical sense and an admirably clear and concise style. Witness the article on the Thirty Years' War, which, among others of a similar nature, he contributed to the Cyclopædia. It was characterized by the editors as a model of lucidity and extreme condensation. The article was as follows:

"Thirty Years' War, a religious and political conflict which involved the German empire, and with it the principal states of Europe, from 1618 to 1648. The causes which led to this struggle reach back to the early part of the 16th century, when the reformation divided Germany into two hostile religious parties. Protestantism, nearly crushed in the war of the Smalcald league, rose triumphant under Maurice of Saxony, and with the peace of Augsburg (1555) Charles V. beheld the chief aim of his policy forever frustrated. By the terms of this peace, which extended to those Protestants only who had embraced the confession of Augsburg, the right was secured to each state of prescribing the form of worship within its limits, and to all subjects, Lutheran or Catholic, the privilege of emigrating from the states where their creed was prohibited. The Protestants were to retain the ecclesiastical possessions which they had appropriated previous to the peace of Passau in 1552. But though the basis of a definite settlement was established, two important points remained on which no agreement could be reached. The Catholic party, to guard against the danger that would accrue to the church in the future appropriation of her prelacies by the Protestants, introduced an article, known as the ecclesiastical reservation, by which all prelates who should henceforth abjure Catholicism were to forfeit their benefices. This article was inserted against the protest of the Lutheran members of the diet. The other point related to Protestant subjects in the ecclesiastical states, for whom the Protestant members sought to secure the right of worship in such terri-

tories. The Catholics refused to admit such an article, and they could only obtain instead a personal declaration to the same effect from the emperor's brother Ferdinand, who presided at the diet of Augsburg. The exclusion of the Calvinists proved another source of contention. Under the rule of Ferdinand I. (1556–'64) and his son, the mild Maximilian II. (1564–'76), a general tranquillity was maintained, while the balance was fast turning toward the side of the Protestants, who in the Austrian territories began to tyrannize over the Catholics. The bigoted Rudolph II. (1576–1612), swayed by the Jesuits and the court of Spain, resolved to repress Protestantism, and in his immediate dominions proceeded to restrict, and finally even to abolish the Protestant worship. Religious disputes again distracted Germany. The enmity between Lutherans and Calvinists equalled their mutual hate for the Catholics. The aulic council, whose decisions were inspired by the imperial court, usurped an unlawful jurisdiction in the empire. In Aix-la-Chapelle the Protestants established their worship in spite of the Catholics (1580), and at first beat back the troops sent to execute the imperial ban. About the same time an opportunity was presented of enforcing the ecclesiastical reservation. Gebhard, archbishop of Cologne, abjured his faith to marry a Calvinist lady, but determined not to renounce his see. He was accordingly placed under the ban of the empire, and a war ensued, which ended in his defeat and expulsion in 1584. A violent contest followed for the see of Strasburg. In 1607 the Protestant imperial city of Donauwörth, whose inhabitants an abbot had provoked to acts of violence by processions, prohibited within the town, was deprived of its liberties, in open violation of the peace of religion. Alarmed for their safety, the Protestant princes, in May, 1608, formed at Auhausen in Franconia an offensive and defensive league styled the 'Evangelical Union.' It soon comprised the Palatinate, Neuburg, Baden, Würtemberg, Brandenburg, Strasburg, Nuremberg, and other states of the empire. Frederick IV., elector palatine, a Calvinist, was placed at its head, though its most active member was Christian of Anhalt. The Lutheran elector of Saxony, however, declined to join the union. On their side the Catholic states, independently of Austria, established the league (July, 1609), with Maximilian, duke of

Bavaria, at their head. In the mean while the Protestants of Hungary and Austria had risen against Rudolph and recovered their rights (see RUDOLPH II., and MATTHIAS); and thus encouraged, their brethren in Bohemia, in July, 1609, wrung the *Majestätsbrief* from the emperor. Amid these disorders the heirless duke of Jülich died (March, 1609), leaving a host of claimants to his dominions, which were at once jointly seized by Brandenburg and Neuburg. Rudolph ordered a levy of troops to enforce their sequestration. The Protestant princes flew to arms, and invoked the aid of France, the Netherlands, and other powers. Henry IV. of France now hoped to execute his design of humbling the house of Hapsburg, and was preparing to invade Germany when the dagger of Ravaillac terminated his career (May 14, 1610). Hostilities ceased, but under the emperor Matthias, who succeeded in 1612, the unsettled claims of Jülich again led to war, and Dutch and Spaniards, called in by Brandenburg and Neuburg respectively, occupied the disputed lands. Matthias, being without heirs, was induced to put forward as his successor his cousin Ferdinand of the Styrian line, whose bigotry and rigor alarmed the Protestants. Ferdinand was nevertheless crowned in Bohemia in 1617 and in Hungary in 1618. But already in Bohemia an event had occurred which precipitated the thirty years' war. The Protestant inhabitants of Klostergraben and Braunau had erected new churches against the prohibition of the archbishop of Prague and the abbot of Braunau, lords of the two places, who enforced their authority by seizing the buildings. Protestants and Catholics appealed to a somewhat obscurely worded clause in the *Majestätsbrief*, which the former contended gave the right of building new churches to the Protestants of the towns in general, while the latter maintained that it extended only to the states and royal towns. The court supported the Catholics, and refused all redress. The storm now burst. On May 23, 1618, an assemblage of Protestants, led by Count Thurn, entered the palace at Prague, and seizing Slavata and Martinitz, the most odious members of the council of regency appointed by the crown, hurled them together with their secretary from a lofty window. They escaped as if by a miracle. Thurn and his associates organized a general rising, and evoked the assistance of the union

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and Mansfeld passed into the Netherlands, but soon renewed the contest with Tilly, who finally drove them from the field. Bethlen Gábor, who had broken the peace of Nikolsburg and penetrated into Moravia, made a truce with the emperor in 1624. The Catholic party was triumphant, but the persecutions and the excesses which now ensued rekindled the flames of war. The states of Lower Saxony rose in 1625, and united with Christian IV. of Denmark, who took the lead in the struggle. England sent subsidies, Holland aided with troops, and Christian of Brunswick and Mansfeld reappeared in the field. Hitherto it was not with the forces of Austria but with those of the league and Spain that Ferdinand had carried on the contest. Wallenstein now came forward with his remarkable offer, and with his own resources raised a vast and independent army for the emperor. In April, 1626, he nearly annihilated the army of Mansfeld at Dessau, and pursued him into Hungary, while Tilly in August overwhelmed the king of Denmark at Lutter. Wallenstein returning drove back the Danes into Jutland and their islands, occupied Mecklenburg and Pomerania, and extended his designs to the Baltic, when the walls of Stralsund arrested his career (1628). Peace was made with Christian IV. at Lübeck, May, 1629. The Protestants were everywhere subdued. Ferdinand had proceeded to consummate the work of the Catholic reaction. He issued the edict of restitution, dated March 6 (N. S.), 1629, ordering the surrender by the Protestants of all mediatized church property secularized since 1552, and the transfer to Catholic prelates of all immediate sees held by Protestants against the ecclesiastical reservation, including two archbishoprics and many important bishoprics. This impolitic measure inflamed afresh the Protestant states. Magdeburg firmly resisted its execution. But the power of Austria and the league was suddenly repressed by a new attack from the north. Ferdinand was combating France in the contest for Mantua. Richelieu, eager to involve him in a foreign war, mediated a truce between Gustavus Adolphus and Poland, and the Swedish hero came forward to the rescue of German Protestantism. At the very moment of this new danger, the league, exasperated by the conduct of Wallenstein, compelled Ferdinand to dismiss him, and Tilly received the chief command. In June, 1630, Gus-

tavus landed in Pomerania and entered into a treaty with the aged and overawed duke Bogislas XIV., and in January, 1631, concluded a subsidiary alliance with France. John George of Saxony, George William, elector of Brandenburg, and other Protestant princes met at Leipsic in February, 1631, and formed a league of neutrality. William V. of Hesse-Cassel became the bold ally of Sweden. Gustavus forced the imperialists from Pomerania and advanced through Brandenburg, but was unable to prevent the terrible fate of Magdeburg, which on May 10 (N. S., 20) was stormed by Tilly and Pappenheim. He now compelled the elector of Brandenburg to enter into a treaty, avoided an engagement with Tilly, and restored Mecklenburg to its dispossessed dukes. Tilly, who had received orders to break up the Leipsic union, attacked Saxony, and drove the mean-spirited elector into an alliance with Sweden. Gustavus marched against him, and on Sept. 7 (N. S., 17), 1631, Tilly sustained a crushing defeat at Breitenfeld near Leipsic. The Catholic power lay prostrate. While the Saxon general Arnheim invaded Bohemia and occupied Prague, Gustavus carried his victorious arms to the Rhine and into Swabia, forced the passage of the Lech, where Tilly was mortally wounded (April 5, 1632), and overrunning Bavaria threatened the Austrian dominions. He was checked by Wallenstein, who, after witnessing with secret joy the misfortunes of the Catholics, had been reinvested by Ferdinand with the supreme command. A new army had arisen at his call. He was joined by Maximilian and Aldringer with the forces of the league, and at Nuremberg the contending armies stood face to face till their ranks wasted away. Then carrying the war northward, they fought a desperate battle at Lützen, Nov. 6 (N. S., 16), 1632. Gustavus fell, but the Swedes remained masters of the field. Pappenheim was among the slain. The death of the Swedish king, which was followed by that of the unfortunate Frederick V., spread consternation among the Protestants. But the Swedish chancellor Oxenstiern was equal to the occasion, while generals like Bernhard of Weimar, Horn, Baner, and Torstenson, trained in the school of Gustavus, emulated his deeds. In 1633 Oxenstiern assembled the states of upper Germany at Heilbronn, and was charged with the conduct of the war. Wallenstein, instead of securing to the

emperor the advantages resulting from the death of his great adversary, surprised the world by his inactivity and mysterious conduct. He led his army into Silesia, and confronted the Saxons and Swedes, but wasted the campaign in negotiations. With a devoted army at his command, he was now bent exclusively on schemes of personal ambition. The suspicions of the court were aroused, and his treasonable designs ended in his assassination in February, 1634. (See WALLENSTEIN.) The chief command was transferred to the emperor's son Ferdinand, who, seconded by Gallas and Piccolomini, advanced through Bavaria. He was joined by Charles of Lorraine and a Spanish army, and on Sept. 6 the Protestant forces under Bernhard of Weimar and the Swedish general Horn were nearly annihilated at Nördlingen. This blow was followed by the defection of the elector of Saxony, who in May, 1635, entered into the peace of Prague with the emperor and turned his arms against his recent allies. The acceptance of the terms of this peace, which sacrificed the Calvinists and Swedes, was to be made compulsory in all the states and enforced by an army of execution. Many of the Protestant states assented or were forced to yield, but Sweden, having no alternative short of relinquishing her conquest, determined to continue the struggle. Richelieu seized the opportunity offered by the depression of the Protestant cause to promote the aggrandizement of France. He renewed the alliance with Sweden, declared war against Spain, and made Bernhard commander of the French forces. Baner began a series of brilliant campaigns, won a great victory over the armies of John George and Hatzfeld at Wittstock, Sept. 24, 1636, and carried the war into the Austrian territories. In the mean while France was attacked by the Spaniards, the imperialists, and Charles of Lorraine, and John de Weert spread terror to the gates of Paris. In February, 1637, the emperor died, and was succeeded by his son Ferdinand III. The year 1638 opened with the successes of Bernhard, who in February captured John de Weert and other generals at Rheinfelden. In December he took the important fortress of Breisach, and outwitted the French by appropriating his conquests. On his sudden death in 1639, France obtained control of his army, and pressed the war with vigor. Torstenson, a general unsurpassed in the celer-

ity of his movements, who became the Swedish commander-in-chief on the death of Baner in 1641, shook the Austrian throne by repeated invasions, overthrew the archduke Leopold William and Piccolomini at Breitenfeld, Oct. 23, 1642, chastised Christian IV. for his designs against Sweden, completely defeated Gallas in 1644, won a great victory at Jankau in Bohemia, Feb. 24, 1645, taking Hatzfeld prisoner, and marched on Vienna. Rákóczy, prince of Transylvania, advanced through Hungary, and Vienna barely escaped the combined attack. On the side of the French, Guébriant signalized himself at Kempen in January, 1642, and the young duke d'Enghien (the future Condé) beat the Spaniards at Rocroy in 1643. But in November, 1643, the French suffered a great defeat at Tuttlingen in Swabia through the genius of John de Weert. Condé and Turenne retrieved this disgrace near Nördlingen in August, 1645, where Mercy, their eminent adversary, fell. Turenne and Wrangel, the successor of Torstenson, reduced Maximilian of Bavaria, the steadfast ally of Austria, to the last extremity. Königsmark, another Swedish general, made himself master of a part of Prague in July, 1648, and the old town, on the opposite bank of the Moldau, had been attacked, though fruitlessly, when on Nov. 3 the news came of the signing of the peace of Westphalia. This peace terminated a struggle which had converted Germany into a vast field of desolation and horror. — As early as 1641 the preliminaries regarding the conduct of the negotiations had been arranged at Hamburg, and Münster and Osnabrück in the circle of Westphalia assigned for the meeting of two separate congresses. At Münster the empire, France, Spain, and the Catholics generally were to negotiate, under the mediation of the pope; and at Osnabrück the empire, Sweden, and the Protestants, under that of Denmark. But discussions on ceremonial and the varying fortunes of the war caused years to elapse before the congresses could assemble and enter upon earnest deliberations. Denmark and the pope ultimately withdrew, and Venice became the mediator. Separate treaties were concluded at Osnabrück (Aug. 6, 1648) and Münster (Sept. 8), and on Oct. 24, 1648, the definitive signatures were annexed. Nearly every power of Europe was represented. Holland and Switzerland were declared independent

of the empire. France gained Alsace, and was confirmed in the possession of the bishoprics of Toul, Metz, and Verdun. Sweden received Pomerania W. of the Oder, together with Stettin and other towns, the island of Rügen, Wismar, and the secularized sees of Bremen and Verden; the whole to be held as a fief of the empire, with three votes in the diet. The Swedes were furthermore accorded 5,000,000 thalers. Brandenburg retained further Pomerania, received the secularized sees of Halberstadt, Minden, and Cammin, and secured the succession to the see of Magdeburg. The elector of Saxony was to retain Lusatia and some minor acquisitions; and the secularized bishoprics of Schwerin and Ratzeburg were allotted to Mecklenburg. The Upper Palatinate with the dignity of elector was confirmed to Maximilian of Bavaria, and an eighth electorate was erected for Charles Louis, son of Frederick V., who recovered the Lower Palatinate. By a singular article the see of Osnabrück was to be alternately vested in a Catholic bishop and a prince of the house of Brunswick-Lüneburg. The possession of the ecclesiastical benefices was placed on the basis of Jan. 1 (N. S.), 1624; and in the case of the Palatinate, Baden-Durlach, and Würtemberg, the Catholics were obliged to accept 1618 as the normal year. The treaty introduced an age of more general toleration in Germany. The peace of religion of 1555 was confirmed and extended to the Calvinists, and the equality of the Catholic, Lutheran, and Reformed creeds was established. In all religious questions the Protestants were to have an equal weight with the Catholics in the diet and high courts of the empire. Each state of the empire was to exercise the right of sovereignty, with the liberty of concluding treaties and alliances. The autonomy thus accorded to the states, and the still further diminution of the emperor's authority, weakened the structure of the Germanic body, and paved the way for foreign intervention. The constitutional provisions of the treaty became the fundamental law of the empire. The peace of Westphalia terminated the religious wars of Europe, and forms a grand landmark in its history. The empire had declined into little more than a confederation of states, and the era of French greatness succeeded to that of Hapsburg ascendancy. Spain acknowledged the independence of Holland, and continued the war against France with disastrous results."

II

THE "HISTORICAL REFERENCE BOOK"

After the completion of his work on the American Cyclopædia and the condensed edition of that work, Louis Heilprin devoted a number of years to the preparation of his *Historical Reference Book* (1884), which has become a standard manual, of unrivalled accuracy. The book is at once a chronological table of universal history, a chronological dictionary of universal history, and a biographical dictionary.

The compiling of the *Reference Book* naturally consumed far more time than would have been necessary under normal conditions, as the author was compelled to dictate everything, and all the consulting of authorities had to be done by other eyes, under his minute direction. If, as was said of the book, it contained not a single misprint, this was the result of such care in writing and proofreading as few similar works have ever had. As regards the labor of verifying conflicting statements of authorities, the preface gives us an instructive clue. In it the author says:

"A few examples may serve to give the reader an idea of the singular pitfalls which beset the path of the chronologist, and of the confusion and contradiction which he constantly encounters. . . .

The utmost confusion prevails in books respecting dates in the seventeenth century and the first half of the eighteenth, resulting from the circumstance that the Gregorian calendar was adopted at different times by different countries. It has been customary with historians down to our own time to retain the Old Style in treating the history of a Protestant country in the period before the adoption of the New Style in that country, but there is no uniformity in this respect, the New Style being very

frequently used. The dates of events of an international character (battles, treaties), events belonging at once to the history of a Protestant and a Catholic country, are given according to the Old Style by one writer and by another according to the New. In treating of the wars between the English and the French in the seventeenth century and the first half of the eighteenth, the French historians will follow the Gregorian calendar, the English to a great extent the Julian. The same writer will not unfrequently use the Old Style in one place and the New in another. The case grows worse when we come to encyclopedic publications, in whose preparation different authorities are consulted at every step. The individual statements in any one work will frequently be found to contradict each other. Let us take some of the principal events in the Thirty Years' War, and examine the chronological statements in various works. The date of the storming of Magdeburg in the 'Encyclopædia of Chronology' is given (under the head of MAGDEBURG) according to the New Style, May 20, 1631; in 'Haydn's Dictionary of Dates,' according to the Old, May 10. The battle of Leipsic (under the head of LEIPSIC) is given in both according to the Old Style, Sept. 7, 1631, and each gives the battle of Lützen (under the head of LUTZEN) according to the New, Nov. 16, 1632. In the notice of General Pappenheim the 'Encyclopædia of Chronology' gives Nov. 6 as the date of the latter battle. In the 'Encyclopædia of Chronology' the battle of Wittstock is stated to have been fought Oct. 4, 1636 (the date according to the New Style) under the head of WITTSTOCK, and Sept. 24 under the head of BANNIER (Banér). The writer of the article AUSTRIA in the last edition of the 'Encyclopædia Britannica' gives the capture of Magdeburg and the battles of Lützen and Wittstock according to the New Style, but the battle of Leipsic according to the Old. In Weber's universal history we have the Old Style for the battles of Leipsic and Lützen, and the New for the battle of Nördlingen (Aug. 27–Sept. 6, 1634) and that of Wittstock. It will occasionally happen that writers who use the New Style will fall into the ludicrous error of adding 10 (11) days to a date already converted to the New Style. In the article on the Thirty Years' War in the very valuable 'Encyklopädie der neueren Geschichte' (Gotha, 1880–'84) the writer,

who uses the New Style, gives March 16, 1629, as the date of publication of the Edict of Restitution, which, however, was dated March 6 according to the Gregorian calendar, and in like manner he states that the battle of Wittstock was fought Oct. 14, 1636, when in reality the true date is Oct. 4, New Style (Old Style, Sept. 24), which date is given in the same work in the article BANER.

Another source of perplexity to the chronologist, more especially in dealing with biographical dates, arises from the circumstance that the time of the beginning of the Christian year has been variously placed at different periods and in different countries, so that it frequently happens that an event described as having taken place in a particular year by a contemporary writer actually falls in a different year according to modern chronological reckoning. In England the year formerly began with the 25th of March. It was not until 1752 that the first of January was made the beginning of the legal year. In parts of Italy, likewise, the first day of the year was the 25th of March down to the close of the last century, and the Pisan reckoning was a year ahead of the Florentine. In the Venetian Republic it was the first day of March. In France during the period of the Capetian and Valois dynasties the year began with Easter. The duchy of Burgundy and portions of the Netherlands had the same reckoning.

Two cases will here be presented in which there is a bewildering confusion in books due to the cause here indicated. The first is the date of the accession of the house of Stuart to the throne of Scotland in the person of Robert II., who was proclaimed king Feb. 22, 1371 (according to the old mode of reckoning, 1370), on the death of David Bruce. Let us first open the 'Encyclopædia of Chronology.' Under the head of SCOTLAND and under ROBERT II. we find the date correctly stated. In the notice of David Bruce, however, that monarch is stated to have died Feb. 22, 1370. In Margaret Macarthur's 'History of Scotland,' which forms part of Freeman's 'Historical Series,' we likewise find 1370. The same error appears three times in Hermann's 'Lexikon der allgemeinen Weltgeschichte' (1882), under BRUCE, SCHOTTLAND, and STUART, and twice in 'Brockhaus' Conversations-Lexikon' (twelfth edition), in the articles

SCHOTTLAND and STUART. 'Pierer's Universal-Lexikon' (last edition) gives 1371 in the article SCHOTTLAND and 1370 under STUART. The second case is the date of the institution of the Order of the Golden Fleece by Philip the Good, duke of Burgundy, on the occasion of his nuptials with Isabella of Portugal. The event took place in the town of Bruges Jan. 10, 1430, or, according to the old mode of reckoning, 1429, the year having to run on till Easter. We find the wrong year 1429 in Beeck's 'Handlexikon der Geschichte und Biographie,' in 'Haydn's Dictionary of Dates,' in Hermann's 'Lexikon der allgemeinen Weltgeschichte' (in the notice of Philip the Good), and in the last edition of 'Pierer's Universal-Lexikon' (in the article on the Golden Fleece and in that on Philip the Good). The 'Encyclopædia of Chronology' gives Jan. 10, 1429 (citing an authority) under the head of GOLDEN FLEECE, and in the notice of Philip his marriage is stated to have taken place on that day, but under the head of BRUGES we are correctly informed that the Order of the Golden Fleece was instituted in 1430.

As encyclopedists are continually contradicting each other with regard to historical chronology, where sufficient pains and easy access to standard sources of information ought to make it possible to insure accuracy, it is natural that we should find a vast amount of discrepancy with regard to biographical dates. In the preparation of a great mass of biographical notices in a cyclopædia the available sources of information must of necessity be in a great measure restricted to the articles in other encyclopedic publications. In a comparatively small proportion of cases only is it practicable to have recourse to works of authority in order to verify statements. The compiler is perplexed at every step, and very frequently it is impossible to arrive at more than an approximation to the truth. Biographical chronology is continually shifting. One has only to take one of the early editions of 'Brockhaus' Conversations-Lexikon' and compare a number of biographical dates with the statements contained in the last edition to appreciate this fact. In every new edition of such a publication the chronology has to be amended afresh. Biographical literature is constantly bringing new alterations, and in every country old documents, registers, and memorials are being brought to light which refute more or less of what has

hitherto been passing for truth. Readers are little aware of the amount of confusion which prevails respecting the dates of birth and death of eminent personages even of our own age. In a not inconsiderable proportion of cases the year of birth is not actually established until after the individual's death. The biographical notice in a cyclopædia of a person lately deceased will therefore very frequently be found to give a different date for the birth from that contained in the preceding edition of the work. The date of Buckle's birth is Nov. 24, 1821. We find the same month and day, but the year 1822 in the last edition of 'Brockhaus' Conversations-Lexikon' (1882), in Bornmüller's 'Schriftsteller-Lexikon der Gegenwart' (1882), in Beeck's 'Handlexicon der Geschichte und Biographie,' and in the necrological list appended to the last edition of 'Men of the Time' (1884). The year 1822 (without mention of month or day) is also given in Thomas's 'Dictionary of Biography' and in the index to the last edition of 'Haydn's Dictionary of Dates.' Du Chaillu was born July 31, 1835. In the twelfth edition of 'Brockhaus' Conversations-Lexikon' he is stated to have been born about 1805; in the fourth edition of Vapereau's 'Dictionnaire des contemporains,' toward the first years of the century; in Embacher's 'Lexikon der Reisen und Entdeckungen' (1882), at the beginning of the century. The error has been eliminated in the last edition of the first two works, and the correct date is also to be found in the 'Schriftsteller-Lexikon der Gegenwart,' published a few months before Embacher's work. The eminent Belgian sculptor Willem Geefs, who died in 1883, is frequently stated to have ended his days in 1860. His biography is omitted from the fourth edition of the 'Dictionnaire des contemporains' (in which the false entry of his death occurs), but he is resuscitated with a full notice in the last edition (1880). It was a brother of Willem Geefs who died in 1860. Another of the celebrities whose career closed in 1883, Abd-el-Kader, had his death more than once prematurely chronicled."

III

LOUIS HEILPRIN'S VIEWS ON RAPID TRANSIT

During the years that followed the publication of his *Reference Book* in 1884 Louis Heilprin's skill as an encyclopædic expert was occasionally sought by publishers, as by the Putnams in their issue of Vámbéry's *Story of Hungary* and by the Century Company in the revision of their *Cyclopædia of Names* — a task successfully carried out by Heilprin, with the assistance of other members of the family, within four months. On the whole, however, his talents were far too long allowed to slumber. He gave instruction in languages to private pupils and taught at a school in Summit with whose spirit and methods he was in sympathy. An academic career, for which he was in many ways admirably fitted and which the advice of influential friends pointed out to him, he never would consider. Not only his inherent modesty, but an invincible belief that his poor sight would stand in the way of efficient work, made him shrink from any attempt to gain a footing in university or college. He delivered a few semi-public lectures on historical subjects in Summit and, many years later, spoke to a circle of friends in Cleveland on the development of the public means of transportation — a subject which, in his hands, became an epitome of the material progress of mankind throughout the ages. Engineering matters at all times engaged his attention. He wrote timely letters to the *Evening Post* on these topics, and on one occasion, in the early eighties, when New York was threatened with a water famine, he outlined in a letter to the *Post* a carefully elaborated plan for husbanding the existing resources. He thought much and wrote not infrequently on matters concerning the public welfare, such as the prevention of railroad collisions and mining disasters. The

most important of his articles relating to engineering subjects, a paper on the Rapid Transit Problem, appeared in the *Engineering Magazine* for July, 1892, and, in the editor's words, caused a sensation. In the light of what experience has proved as to the inadequacy of the solution then adopted, Mr. Heilprin's remarks were nothing less than prophetic. The article was as follows:

"The problem of rapid transit in great centers of population is one of such universal interest, and it is now pressing for solution in so many cities, that engineers and business men the world over can not go amiss in posting themselves thoroughly upon the phases of the subject now presented for practical solution in New York. Each city has its own problem, and there are of course certain conditions present at one point which do not exist elsewhere. But it is everywhere a question of railways, high speed and large seating capacity; and hence the attainment of these ends in any one locality is very apt to offer a solution of the problem which will be, in the main, of universal application. And in New York — the metropolis of the Western world, built upon a long, narrow island — the conditions are so unusual and the requirements so extreme, that what accomplishes the purpose there will undoubtedly serve as an object lesson of the greatest possible utility and value elsewhere.

The opinion is entertained at present by the Rapid Transit Commission of New York that the needed additional means of travel will have been supplied by the construction of a system of railroads, mainly underground, consisting of two four-track arteries, one on the east side and one on the west side of the city, extending from the vicinity of Union Square to Harlem, with a double-track continuation in the suburban sections, and of a main four-track artery extending from Union Square to the Battery. A close examination will show that this presumption is not well founded and not likely to be justified by events.

Experience has taught us that in the case of great engineering enterprises in a rapidly-growing population, the most generous provisions for the demands of the future are apt to prove inadequate. The construction of the present system of elevated railroads once appeared to be the solution of the problem of rapid

transit in New York. Fifteen years ago most people in that city no doubt felt confident that two double-track routes would suffice. Four such roads were built. Within two years the system had proved itself to be a failure with respect to meeting the demands of the public. Increasing the frequency of train-service, lengthening the trains, introducing more powerful engines — nothing has availed to check the increasing discomfort of travel or the diminution in its rapidity. Many persons, indeed, are beginning to lose sight of the fact that the roads were constructed for the purposes of rapid transit. For a portion of the day the average rate of speed on Third avenue has been reduced to about ten miles an hour, although between many of the stations a speed of twenty-five to thirty miles an hour is maintained for a few seconds at a time. Ten miles an hour can hardly be called rapid transit in this age of air-brakes, when on a perfectly straight and well-constructed road-bed almost any degree of speed is deemed compatible with safety.

But what the elevated roads have failed to provide is not rapid locomotion so much as means of traveling like human beings. On the two principal lines the travel during the busiest portion of the day is about double what can be carried comfortably. The seating capacity of a train of five cars, as now run, is about 250, while the full complement reaches or exceeds 500. On these two lines alone eight tracks would be required to handle the present traffic so as to afford sitting-room to every passenger. It may here be asked what do we mean by the present traffic? Promise seats to all passengers, and the amount of traffic will be swelled by the many thousands who now prefer the accommodations of the surface roads to the crowded trains of the elevated roads. At a low estimate the traffic of the latter would be increased by 25 per cent., and we should find that ten tracks on Sixth and Third avenues would barely suffice for the exigencies of the present.

Let figures speak. We shall measure transporting capacity by the number of seats that can be furnished per hour. With trains running on a single-track road at intervals of one minute, each train to consist of five cars of fifty seats each, that number is 15,000. With ten tracks, therefore, we should be able to provide only 75,000 through seats per hour in one direction. During the

four busiest hours of the day we should be able to transport in one direction no more than 300,000 passengers.

This rate of transportation would about represent the demand that would now be made upon the Sixth- and Third-avenue lines alone in the thickest of the evening crush, were the ordinary comforts of travel secured to the public. Under present conditions, with a dozen lines of horse-cars actively competing, it is safe to assert that on the four elevated roads taken together the rate at which the tickets are dropped into the boxes at all the stations exceeds at the busiest time of the day 100,000 per hour. Four elevated tracks each on Third and Sixth avenues would fail to meet the present demands of the traveling public. A well-constructed and well-equipped viaduct road along the line of either of these thoroughfares, affording real rapid transit between the Battery and the northern limits of the city, could not conveniently dispose of the traffic it would be called upon to handle without running trains in one direction on three tracks at least. Ordinarily speaking this would mean twelve tracks for the two lines, but in order to meet possible objections we shall allow that while six tracks are being used in one direction four tracks will suffice for return trains.

At this point it may be argued that we might add to the carrying capacity of the roads by running the trains at a higher rate of speed than at present, thereby diminishing the average duration of the trips. But increasing the speed cannot of itself add to the carrying capacity of a railroad, otherwise than by enabling a given amount of rolling-stock to do more service in a given time. A higher rate of speed does not by any means imply increased carrying capacity. This will be determined solely by the interval of time between successive trains. If the schedule provides, for example, for the despatching of thirty trains per hour on one line of rails, then it will be immaterial as far as carrying capacity is concerned whether the average speed is ten or forty miles an hour. In the former case, indeed, four times as many cars may be required as in the latter, but if the supply of cars does not run short, there will be no diminution in the carrying capacity. The same number of trains will pass any particular station within a given time in the one case as in the other, and the chance of obtaining a seat will be the same. In-

creasing the speed will not diminish the pressure on the roads. On the contrary, it can be shown that it will tend to increase it, and this paradox enters as a cardinal factor in the problem of rapid transit. Suppose that with a maximum velocity of twenty miles an hour it is safe to allow trains to follow each other at intervals of one minute; this will give us, under existing conditions, 15,000 seats per hour. Now suppose it were proposed to increase the maximum speed to forty miles an hour. Evidently it will no longer be safe to run the trains with a leeway of only one minute. At twenty miles an hour a train can be brought to a standstill in about six seconds, while at forty miles an hour twelve seconds or more will be required, the retarding action of the brakes not increasing with the velocity. In these twelve seconds the faster train will have passed over four times the ground traversed by the slower train in six seconds. Thus, if the latter can be brought to a standstill in a distance of ninety feet, the former will (roughly speaking) run 360 feet from the moment the brakes are applied until its motion is completely arrested. A still more important factor in the determination of the minimum interval between trains is the violence of the shock in case of a collision. With a maximum of twenty miles an hour a serious collision would be almost an impossibility. With forty miles an hour there is always the possibility of a great catastrophe.

The minimum interval at twenty miles an hour would have to be more than doubled for forty miles an hour. It could hardly be safe to allow trains to succeed each other at the latter speed at a shorter interval than two-and-a-half minutes. This would give us twenty-four trains, or 120 cars, per hour, with a seating capacity for through passengers of only 6000. In the case of rapid-transit roads in a city of 1,700,000 inhabitants, whose dwellings and places of business occupy a narrow strip fifteen miles long, and whose capacity for locomotion far exceeds the real carrying capacity of the existing lines of communication, an increase of velocity in the transporting apparatus implies an increased number of tracks.

If it be proposed to run fast express trains between the Battery and Spuyten Duyvil on one side and between the Battery and Fordham on the other, and to provide equally rapid transit

street, then our ten tracks on
would soon have to be expanded
igh rate of speed attempted for
as well as long hauls, even if
reased to seven cars of the type
all used in the same direction,
rvey more than about 125,000
h comfort and absolute safety.
on Second avenue and Ninth
the trains could be reduced
e now, but the former at least,
rains, could not do more than
ide of travel that passes over
urs. To sum up, a satisfactory
w York as it is to-day would
ten tracks (including two un-
e) a total of eighteen to twenty

ering the needs of New York as
ow attempt to look a short dis-
en years, at the present rate of
ople will have been added to the
h such improved means of com-
d by the proposed eight under-
ould be given to building opera-
hattan Island and the annexed
gh a whole new city had been
m the truth if we assume that
half a million souls will repre-
mber of rapid-transit passengers
n each direction. This figure
ressure upon the railroads dur-
of 20,000 passengers an hour in
of a transit system of the high-
ted above 10,000 per hour per
would have to be met by three
during the next ten years there
of population from the district
the upper portions of the city,

a fresh wave of travel would impose an additional pressure as great as a double set of rails would bear, and if the old crowded tenement quarters should begin to drain northward, still another pair would be required from this cause alone.

In addition to all this, traffic in general tends constantly to swell, irrespective of increase in population; witness the constantly increasing mass of non-residents who patronize every means of conveyance in and around the city. Making allowance for this natural increase, it is a fair estimate to make when we say that to provide satisfactorily for the needs of New York in the immediate future, a system of railroad transit really expeditious, convenient and safe, operated either by steam or electricity, or both, ought to embrace not less than twenty-five sets of rails. This is 50 per cent. more than would be afforded by the existing elevated roads and the eight tracks of the proposed underground systems, namely, sixteen in all. By the time the projected underground railroads can be completed, New York will not be much nearer to the solution of the problem of rapid transit than at the time of the inauguration of overhead transportation. There was a time when there was a charm in the term 'double-track' — a time when most people believed that the carrying capacity of a four-track steam-road was practically boundless. There was a time when the idea of eight parallel elevated tracks, without crossings or obstructions, implied to every one the end of the discomforts and annoyances of travel. There are those now who believe that eight additional tracks will solve the problem. To believe this is to be lacking in perspective and to ignore the experience of the past.

No system of rapid transit ought to be deemed sufficient to meet the needs of the immediate future of New York (which by 1900 will have nearly doubled the population that it had in 1878, when the Sixth-avenue elevated road was opened) that does not offer a transporting capacity, combining speed with comfort, for about 150,000 passengers in one direction per hour. The proposed eight underground tracks will not permit this figure to be reached unless the idea of really rapid locomotion is abandoned and the system of haulage, with respect to speed and stops, is assimilated to that now existing on the elevated roads. But what New Yorkers are looking forward to is real rapid

transit and not pseudo-rapid transit. If the means of locomotion are to be mainly underground then is actual rapidity of transit more imperative than ever. There is no reason why we should be satisfied with the ten miles an hour which the Third-avenue elevated road affords below Sixty-seventh street, and the eleven or twelve miles which the easier grades enable the Sixth-avenue line to achieve below Fiftieth street, even if each passenger were sure to find a luxurious seat on entering the car.

We have been discussing the projected underground scheme on the assumption that it would offer eight additional tracks, thus doubling the existing capacity for rapid-transit communication. But as a matter of fact the scheme provides for only four tracks in that part of the city south of Union Square. This idea of compressing the traffic into a four-track main artery under Broadway for a distance of two miles and a half (Fourteenth street to South Ferry) is simply preposterous. Even if the scheme provided for an efficient system of loops in the vicinity of Union Square, so that a considerable proportion of the trains might be cut off at that point so as to relieve the lower section, the feature in question would be a great mistake. But if the stream of traffic conveyed over a system of eight tracks is to be made to converge into four, then we are simply crippling the means of transportation represented by that system. If all the trains are to be run over the entire course we shall simply be establishing a limit of carrying capacity which will be determined by the work which two lines of track used in one direction can be made to perform. Assuming that the terminal loops and switches can be made to operate so efficiently that not a moment is lost in reversing the direction of the trains, how many seats shall we be able to carry from the City Hall to Union Square in an hour? Whatever figure we shall arrive at will measure the maximum carrying capacity of the entire system.

If we despatch trains at the rate of one a minute on each of two tracks, if each train consists of seven cars, and if each car has a seating capacity of fifty, we shall obtain a total maximum of only 42,000 seats per hour. This would not be the solution of the problem of rapid transit for New York. But is the despatching of trains of the size in question at the rate of one

a minute on a single track really compatible with rapid transit? Considering the inevitable proximity of the stations to each other in the lower part of the city, and the fact that the trains in their northward course by the time they reach Fourteenth street will have taken on board about three-fourths of their total complement of through passengers, there can be no exaggeration in assuming that in this section of two miles and a half the average rate of speed, including stops, during the hours of greatest traffic, would not exceed ten miles an hour. Fifteen minutes would have to be consumed between Fourteenth street and South Ferry. There could hardly be any pretense of running trains in this portion of the route on 'express' schedule, for this would imply an inadmissible lengthening of the intervals between the trains.

If eight underground tracks are needed above Fourteenth street it is absurd to imagine that four will suffice for the remainder of the distance. But the idea of having only four tracks for these two-and-a-half miles evidently has its root in the notion that the great underground thoroughfare ought to be as far as possible directly under Broadway. It is true that more than four parallel tracks cannot very well be located on the same level under Broadway without descending to a greater depth than the Commission considers admissible. But is there any absolute necessity for locating the underground road precisely on the line of this thoroughfare? Better travel in comfort under the Bowery or South Fifth avenue than be packed like herrings under the aesthetic blocks of Broadway buildings. It might be well, indeed, for the east and west lines to converge somewhere in the vicinity of Union Square so as to meet in a capacious transfer station, which should permit passengers from the east side passing over to the west side and *vice versa;* but after thus meeting, the two roads ought to diverge again and pursue an independent course to the extremity of the island, from a quarter to an eighth of a mile on either side of Broadway.

Another exhibition of short-sightedness is the opinion that a double track on either side will suffice for the demands of New York beyond the Harlem river. These outlying portions of the metropolis to be brought close to the business portions must be served with a system of transit embodying a very high rate of

speed. We have seen that the capacity of a double-track road with trains run at express speed can hardly be rated higher than about 6000 passengers per hour in one direction. Now if the region along the Harlem and about Spuyten Duyvil creek had the transit facilities which it asks for, by the time the district was built up a double-track road would in all probability not accommodate one-third of the travel, the condition being that speed and comfort alike shall be secured to passengers.

Whether or not the construction of underground railroads as the chief means of conveyance in the metropolis be rendered imperative by present and future conditions — there are those who believe that the idea of a grand system of overhead communication ought not yet to be abandoned. One thing certain is that in spite of all possible improvements in the matter of lighting and ventilation, the necessity of underground travel will be in itself nothing short of a misfortune to the citizens of New York. If it is to be endured, let such provision at least be made that the traveling public shall not have to face underground the discomforts, delays and vexations which beset our present aerial transportation.

The New York of the immediate future will be a city of two million inhabitants, this mass of humanity oscillating like a pendulum back and forth once a day. To provide for this movement in a satisfactory way, to reduce the friction within endurable bounds, the system of communication will have to be on a scale far more gigantic than our engineers seem prepared to contemplate."

IV

"THE GEOGRAPHICAL CONQUESTS OF THE CENTURY"

For many years, though sometimes at long intervals, Mr. Heilprin contributed to the *Nation* and *Evening Post* occasional book reviews and articles on foreign affairs — printed as editorials — which were always welcomed by the editors. When, at the close of 1900, the *Evening Post* published an encyclopædic account, by noted writers, of the achievements of the century, Mr. Heilprin was invited to contribute an article on "The Geographical Conquests of the Century." It was a subject with which he was thoroughly familiar. As in the field of history, so in geography there was scarcely an important fact that his memory had not stored up. The article is here reprinted:

"The third century after the discovery of America drew to its close with a veil of darkness still shrouding half the globe from the eye of civilized man. A Strabo or a Ptolemy, if questioned in 1800 as to how much of the earth's surface he could describe with accuracy, would have had to confess that he was quite familiar with only one of the grand divisions, and that one embracing only a tithe of the land of our planet. He might perhaps have claimed that he could make a tolerable map of South America, whose interior had been partly opened up by the zeal of the Jesuit missionaries. It would, however, have been full of great voids, representing regions unknown to him. He would have been able also to construct a map of Asia, approximately reproducing its main features, but his outlines would have been merely the frameworks of blurred and empty pictures. The Himalayas had not been measured — the Andes figuring as the highest mountains on the globe. There was a boundless area

within the Chinese empire untrodden by Europeans. In Asiatic Turkey, Persia, and in Afghanistan, in Turkestan, and the Pamir, there were whole regions removed from the ken of cartographers. Scant information existed regarding Japan, Farther India, and the Malay archipelago; next to nothing was known about Korea, and the interior of Arabia was almost a blank. Australia was still floating as a cloud on the horizon. Most of the lands north of America had not yet been discovered, and the Antarctic realm had barely been touched.

The accurate knowledge of Africa was limited in the main to a narrow strip along the coast. As for the interior, comprising about one-fifth of the earth's land surface, geographical learning had hardly begun to outgrow its mediæval estate. Cartographers had been groping their way amid the confused reports of traders, slave-dealers, and missionaries. The feature of equatorial Africa regarding which the most correct conjecture had obtained for centuries, was the source of the Nile, which river, in accordance with the teachings of Ptolemy and the old Arab geographers, was represented on the maps as issuing from some lakes in the heart of the continent, fed by the Mountains of the Moon. Geographers knew of a great river that flowed by Timbuktu, the Queen of the Desert, and which they called the Niger, a name handed down from the time of the ancients. It had long been supposed that this stream had a westerly course and that the Senegal and Gambia formed its delta. A counter theory was that it flowed eastward to a large lake, a view based in part upon vague reports about Lake Tchad. Still another theory regarded the Niger as one of the great arms of the Nile. The Congo was known only in the last portion of its interminable course, although as far back as the seventeenth century the opinion had been entertained that it issued from the same quarter of the continent as the Nile. The Sahara remained untravelled by Europeans, except near its margin, and the great lakes of Africa were known only through tradition or vague report.

In North America the region between the Mississippi and the Pacific and north of New Mexico still belonged in great part to the realm of fancy. We read in the first American edition of Guthrie's 'New System of Modern Geography' (Philadelphia, 1795): 'In North America, which is chiefly

composed of gentle ascents, or level plains, we know of no considerable mountains, except those towards the Pole, and that long ridge which runs through the American States, and which is called the Apalachian or Allegany Mountains.' British America remained in great part unexplored, and the coast of Alaska had barely been grazed. There were whole regions, like the Adirondack wilderness, included within the bounds of the original States of the American Union, which were still sealed to geographers.

Nearly 300 years after the tracing of the coast-line of Africa was completed by the voyages of the Portuguese, the systematic exploration of the interior may be said to have commenced in 1788 with the foundation in London of the African Association, an event which inaugurated a new era in the history of geographical discovery. This society had the good fortune to command almost at the start the services of the intrepid Scotsman, Mungo Park. Before this, it is true, the pioneer of modern African exploration, Sir James Bruce, had made his memorable journey along the Blue Nile, and the ornithologist Le Vaillant had travelled in the hunting-grounds of South Africa. Just before we hear of Mungo Park, the record of discovery also tells of a narrow wedge driven towards the heart of the continent in the journey of Browne from Assuan to Darfur. The African Association assumed for one of its first tasks the unravelling of the mystery of the Niger. The journeys of Mungo Park (who perished in the stream in 1806), of Clapperton and Denham, and of Lander, covering together the period from 1795 to 1830, revealed the course of the river. The French, meanwhile, explored the Senegal and Gambia. At this time English explorers began to push from the Guinea coast into the warlike kingdoms of Ashanti and Dahomey. In 1826 the ill-fated Laing, and in 1828 Caillié, succeeded in reaching Timbuktu, that mysterious seat of Islamism which had for centuries fascinated geographers.

The close of the eighteenth century was the beginning of a new era in the annals of American exploration. The travels of Alexander von Humboldt between 1799 and 1804 in the basins of the Orinoco and Magdalena, and in the Andes and Mexican Cordilleras, mark an epoch in the history of geography and

natural science. His work was taken up and extended to other regions, especially Brazil, by eminent naturalists like Maximilian of Wied, Spix, Martius, Auguste de Sainte-Hilaire, Orbigny, and Pöppig. These had worthy successors in the brothers Schomburgk (British Guiana), Darwin (Patagonia, Tierra del Fuego), Avé-Lallemant (Brazil), Tschudi (Andes, Brazil), Castelnau (Brazil, Bolivia, Peru), and Burmeister (Brazil, Argentina).

By the acquisition of the Louisiana territory in 1803 the United States came into possession of a boundless domain, in great part as far removed from the knowledge of white men as the heart of Africa. An exploring expedition was immediately sent into this *terra incognita* under Lewis and Clarke, who proceeded up the valley of the Missouri, crossed the divide of the Rocky Mountains, and followed the Columbia down to the sea. The explorations of Pike, Long, Bonneville, Catlin, Nicollet, and Frémont, the opening of overland routes to Utah and California, and the Government survey for a Pacific railway made deep rifts in the trans-Mississippi region; but its greatest wonders were to remain enshrouded until the tide of colonization had begun to sweep over the whole area. It was not until 1832 that the Mississippi River was traced to its source by Schoolcraft.

The exploration of the Arctic regions, in the hope of finding a northern water route for the trade with the East, had lost much of its fascination by the eighteenth century. Russia alone prosecuted it systematically in the course of that century, accomplishing a great work in tracing the coast line of Siberia. About the beginning of the nineteenth century the idea of a Northwest Passage was revived in England, and the dream of reaching the Pole began to be entertained. A great and persistent onslaught upon the frozen North was inaugurated in 1818. The labyrinth of islands, peninsulas, and ice-bound passages north of the American continent yielded up its intricacies to the assaults of Parry, the two Rosses, Sir John Franklin (to whose tragic end Arctic discovery owed much of its rapid progress), McClure, Kane, McClintock, and Hayes. The exploration of Arctic British America was prosecuted on land with heroic energy by Franklin, Back, Richardson, Beechey, Dease, Simpson, and Rae. Parry, in an attempt to reach the

Pole in 1827, dragged his sledges over the floating ice-fields to the parallel of 82 degrees 45 minutes, eclipsing all previous records by more than a degree of latitude. In 1831 James Clark Ross solved the mystery of the position of the north magnetic pole, which he located in the peninsula of Boothia. McClure entered the Arctic Ocean through Bering Strait in 1850, proceeded eastward, was beset for years in the ice, joined hands in 1854 with an expedition which had come in the opposite direction, and thus carried off the laurels of the Northwest Passage. While a great breach was being made in the Arctic fastnesses, Bellingshausen, Weddell, Dumont d'Urville, Sir J. C. Ross, Wilkes, and others extended geographical discovery into the Antarctic regions. Ross discovered Victoria Land, with its active volcanoes, and in 1842 advanced beyond the seventy-eighth parallel. During this same period the cruel depths of Australia, whose coast had been explored by Flinders in 1801–3, were invaded by Sturt, Eyre, and the ill-fated Leichhardt.

A flood of light was thrown upon the geography of northern and central Asia in the first half of the nineteenth century by the journeys of Ermann, Humboldt, Middendorf, Huc (who entered Lhassa, the holy city of Tibet), and others; while men like Webb, Moorcroft, and Wood scaled the heights of the Himalayas and the Pamir, and reached the head streams of the Indus, Ganges, and Amu Daria. From 1848 Mt. Everest, with the 29,002 feet given to it by the trigonometrical measurement of Sir Andrew Waugh, figured as the highest point on the globe. Among the naturalists who were attracted to the Himalayas, the name of the botanist Hooker stands preëminent. The most distinguished traveller in southwestern Asia in the early part of the century was Burckhardt, who succeeded in entering the holy places of Mecca and Medina. In 1829 Ararat was ascended by Parrot. In 1832–3 Alexander Burns performed his famous ride from India to Bokhara. The travels of Crawfurd and MacLeod in the second quarter of the century dispelled in part the obscurity hanging over Farther India. Between 1835 and 1849 the naturalist Junghuhn explored Java and parts of Sumatra. Among his successors in the Malay Archipelago were St. John and Wallace.

Down to the time of the French Revolution Europe had hardly dared to cast a covetous eye upon the interior of Africa. Portugal, England, and France held sway at a few stations along the coast. The sturdy Boers, near the Cape of Good Hope, alone represented actual colonization by Europeans. The Revolution brought in its train Bonaparte's conquest of Egypt, the first great onslaught upon African territory on the part of Christendom in modern times. The consequences of the French domination, brief as it was, were far-reaching in the loosening of Turkey's hold upon that country. Another result of the wars of the Revolution was the supplanting of Dutch dominion at the Cape by that of England. An army of ardent missionaries now made their way into the interior of South Africa. While England was laying the foundations of an empire at this end of Africa, France suddenly invaded the North and conquered Algeria (1830–48). A few years before this invasion Mehemet Ali, Viceroy of Egypt, brought Nubia and Kordofan under his sway. This ambitious potentate, who, for the first time since the days of Saladin, made the aggressive power of Africa felt in another continent, in his rôle of modernizer of Egypt, sent various scientific expeditions to explore the Nile, which was now traced almost to the equator. To this period of African exploration belong the travels of Rüppell, the brothers Abbadie, Beke, and Krapf in Abyssinia.

With the middle of the nineteenth century commences an extraordinary era in the history of geographical discovery. The world begins to close in upon the dark interior of Africa, which is assailed on every side, and in the course of a generation the great features of the continent are unfolded almost in their entirety. In 1847 the German missionaries Krapf and Rebmann discovered the snow-capped peaks of Kilimanjaro and Kenia, near the equator. In 1849 Livingstone discovered Lake Ngami, in the heart of South Africa, at a distance of a thousand miles from Cape Town. In the course of the next seven years he extended his explorations to the upper Zambesi, of which mighty stream hardly anything had hitherto been known, followed it up, struck out westward along the edge of the Congo basin (a circumstance unknown to him), made his way to the Portuguese possessions on the Atlantic, then, turning back, followed the

Zambesi down stream, discovered the Victoria Falls, the rival of Niagara, and reached the shores of the Indian Ocean. While Livingstone was drawing a luminous trail across South Africa from sea to sea, Heinrich Barth was lifting the veil from the depths of the continent on the other side of the equator by his extraordinary journeys in the western half of the Sudan. In the sixth and seventh decades of the century large accessions were made to the knowledge of the Nile basin and the surrounding regions, including Abyssinia, by the travels of Petherick (who explored the basin of the Bahr-el-Gazal), Munzinger, Beurmann, Heuglin, and others. In the meanwhile, the French were pushing into West Africa on the side of Senegambia, Du Chaillu travelled in the country back of the Gabun and through the wilds of the Ogowe, the home of the gorilla and the pygmy Obongo; Burton scaled the Peak of Kamerun, and Von der Decken explored what is now British East Africa.

Just as Barth was emerging from the scorching suns of Central Africa, laden with the knowledge of countless peoples, in another continent three equally intrepid Germans proceeded to explore the most elevated region of the globe. The brothers Schlagintweit crossed the Himalayas and the Karakorum, traversed the lofty plateau of Tibet, and surmounted the Kuenlun, reaching heights to which no traveller had ever climbed.

Soon after Livingstone's traverse of South Africa the beginning was made of those discoveries which unravelled the most interesting problem presented by the geography of that continent. In 1858 Burton and Speke, dispatched by the Royal Geographical Society, in quest of a great reservoir of fresh water which was believed to exist somewhere in the region whence the Nile issued, discovered Lake Tanganyika. Before the close of that year Speke discovered a still larger lake, the Ukerewe, or Victoria N'yanza, which he assumed to be a reservoir of the Nile, although as yet its outlet remained to be found. To what river system, if any, Lake Tanganyika belonged was a problem which was to wait still many years for a final solution. In 1859 Livingstone came to the shores of a third great lake, the Nyassa, a feeder of the Zambesi. Within the next five years the question of the sources of the Nile was approximately settled by the explorations of Speke, Grant, and Baker. The last-named, ascending

the river from Egypt, in 1864, discovered the lowest of the Nile reservoirs, the Mwutan Nzige, or Albert N'yanza. What Ptolemy had laid down on his famous map 1,700 years before was found to be substantially correct, and the discovery later on of snow-clad mountains near the Albert N'yanza, culminating in Ruwenzori, substantiated what the Greek had taught regarding the Mountains of the Moon.

The problem of the Nile was closely interwoven with that of the Congo, the greatest mystery that still confronted geographers outside of those presented by the polar regions. The Nile question, indeed, could not be regarded as completely settled until the watershed between the two rivers had been determined. Of the Congo basin, equal in extent to that of the Mississippi, but a mere fraction was known to the world. A boundless maze of tropical forests and rivers had thus far escaped the eye of Europeans. Geographers were not even agreed as to whether the Congo issued from the heart of the continent, or whether it was not rather in the nature of a coast river. Livingstone applied himself with heroic resolution to the task of ascertaining the parting of the waters that found their way to the Mediterranean and those that flowed toward the Atlantic. In 1867–8 he discovered the Luapula, the eastern head-stream of the Congo, and its two large reservoirs, Mweru and Bangweolo, and in 1871 stood on the banks of the great river that hurries past Nyangwe, but not possessed of the information that would assure him beyond doubt that it could be no other than the Congo.

During these years wide explorations were made in Central Africa, north of the equator, by Rohlfs, Nachtigal, and Schweinfurth. Nachtigal, a worthy successor of Heinrich Barth, succeeded in making his way into Wadai, a Mohammedan state in the Sudan, a goal the pursuit of which had cost the lives of two eminent explorers, Vogel (1856) and Buermann (1863). Schweinfurth penetrated into the cannibal regions west of the equatorial Nile, and in 1871 came to the Welle, whose westward course convinced him that he had travelled beyond the bounds of the Nile basin.

These journeys were coincident with a remarkable epoch in the geographical annals of America. The explorations of Dall revealed the extent of the Yukon; the mountain systems of the

West were explored by Wheeler, Whitney, and Hayden; Powell discovered the grand cañon of the Colorado; Washburne and Hayden made known the marvels of the Yellowstone. The knowledge of British America was at this time greatly extended by the travels of Bell, Selwyn, Dawson, and others. Simultaneously with the exploration of the mountains of North America, the geological structure of the Andes was laid bare by Reiss and Stübel who ascended the volcano of Cotopaxi to its summit.

While the rest of the world was engaged in prying open the recesses of the continents, the Russians were displaying extraordinary activity in the exploration of their vast Asiatic domain and the regions bordering on it. In the first fifteen years of the reign of Alexander II., Semyenov, Valikhanov Radlov, Ostensacken, Syevertsov, Fedtchenko, and Kaulbars assailed that mighty mountain barrier, composed of the Altai, Alatau, Tian-Shan, Alai Tagh, and the Pamir, which shuts off the elevated desert region of central Asia from the plains of western Turkestan and Siberia. During the same period Shishmarev, Mattussovski, and Pavlinov penetrated into Mongolia, and Palladius into Manchuria. The Russian advance into the central Asiatic highlands met with a prompt response from beyond the Himalayas, whence Hayward, Shaw, and Forsyth pushed into eastern Turkestan, while the pundit Nain Singh made a memorable traverse of Tibet.

When Japan and China, soon after the middle of the nineteenth century, opened their portals to the world, the work of exploration previously inaugurated by dauntless missionaries and naturalists, proceeded with a new impetus. Great journeys were made in China by Blakiston, Pumpelly, Ney Elias, Bastian, Cooper, and Richthofen, who belongs to the foremost rank of Asiatic explorers. In the decade beginning with 1861 explorations were made in the Caucasus by Radde, in northern Arabia by Palgrave, and in Turkestan by Vámbéry, and Lagrée and Garnier traced the course of the Mekong as far up as the Chinese province of Yunnan. Contemporaneous with these travels were the remarkable journeys performed in Australia by Burke and Wills, MacKinlay, Stuart, and Forrest, whose exploits were emulated by Giles and Warburton.

The year 1871 is memorable in the history of geographical

discovery for the dramatic episode of the finding of Livingstone by Stanley. The meeting by the waters of Tanganyika was followed by the exploration of the northern end of the lake, which was found to have no outlet in that direction. Livingstone then returned to the scene of his recent labors, the Luapula-Lualaba basin. On May 1, 1873, he expired on the shores of Lake Bangweolo, which he had discovered, and which he had become convinced belonged to the Congo system. In 1874 Cameron discovered that Lake Tanganyika was connected by an outlet, the sluggish Lukuga, with the river formed by the Lualaba and Luapula. This river (which Livingstone had reached in 1871 at Nyangwe) was found by Cameron to flow at too low a level to admit of its belonging to the Nile system. This fearless traveller was prevented by the hostility of the natives from descending the stream and verifying his belief that it was the Congo. It was reserved for the dauntless spirit of Stanley to bring the mightiest of African rivers within the ken of mankind. In November, 1876, he embarked at Nyangwe in a fleet of canoes, and, performing an unprecedented voyage, which twice carried him across the equator, he reached the tides of the Atlantic in August, 1877. And now came the great task of exploring the Congo tributaries, which enlisted the energies of Stanley, Capello and Ivens, Buchner, Pogge, Wissmann, Grenfell, Wolf, Brückner, and Van Gèle.

While the veil was being lifted in this quarter, new light was thrown upon the regions west of the upper Nile by the travels of Junker, Casati, Gessi, and Lupton, the country between the Welle and the coast was opened up by Fischer, Thomson, and Johnston, the naturalist Emil Holub travelled in the Zambesi region, and the explorations of Brazza between the Ogowe and the Congo laid the foundations of a new French colony. Between 1877 and 1881 Serpa Pinto made his traverse of South Africa, Oskar Lenz performed a journey from Tangier to Timbuctu and thence to the Senegal, and Matteucci crossed from Massowah to the Shoa highlands. At this time began the extraordinary career of Emin Bey (Eduard Schnitzer), administrator, explorer, naturalist, and linguist, in the region of the equatorial Nile. This heroic commander, the peer of the great explorers, was cut off for years from the world by the Mahdist

uprising, until at last Stanley succeeded in reaching him by way of the Congo and Aruwimu, an exploit which recalled the days of the *Conquistadores*. In 1887 the Rudolf Lake was discovered by Teleki. In 1889 Meyer reached the summit of Kilimanjaro.

During the years which revealed the sources of Africa's greatest rivers the exploration of the mighty tributaries of the Amazon was prosecuted by Chandless. A little later Crevaux won laurels in the same field, and to him succeeded Karl von den Steinen and Ehrenreich.

The decade which witnessed the solution of the Congo problem, the last great mystery that had remained hanging over the equatorial zone, was marked by renewed activity in Arctic research. The passage leading north from Baffin Bay, beginning with Smith Sound, appeared to promise access to an open polar sea, the theory of whose existence had been put forth by Kane. The American expedition under Capt. Hall in 1871 proceeded up this channel, and the splendidly equipped British expedition under Sir George Nares in 1875 followed in its wake; but Kane's theory was not verified. Some of Nares's men in 1876 reached the parallel of 83 degrees 20 minutes, eclipsing Parry's record by more than half a degree. Lieut. Lockwood of the ill-starred Greely scientific mission in 1883 made a farther gain of four minutes. In 1873 the Austrian expedition of Weyprecht and Payer discovered Franz-Josef Land. In 1878–9 Nordenskiöld immortalized himself by accomplishing the Northeast Passage.

While Stanley and his successors were opening up the exuberant forest realm of equatorial Africa, the arid expanse of central Asia, stretching from the Pamir on the west to the highlands of Manchuria on the east, and embracing the desert of Gobi (Shamo), the Tarim basin, with the Takla Makan desert, and the ranges of the Tian-Shan, Kuenlun, Altyn Tagh, and Nan-Shan, was attracting the most intrepid explorers from all parts of the world. This illustrious roll includes the great Przhevalski (whose name is borne by the former town of Karakol, in Turkestan, where he died in 1888); Sosnovski, Mushketov, Kostyenko, Potanin, Regel, the pundit Krishna (who removed the long-existing doubt regarding the identity of the

Sanpo and Brahmaputra), Pyevtsov, Bell, Bogdanovitch, Roborovski, Carey, the brothers Grum-Grzhimailo, Rockhill, Younghusband, Bonvalot, and Henry of Orleans. These had distinguished successors in the last decade of the century in Dutreuil de Rhins (murdered by the Tibetans in 1894), Littledale, the young Swedish geologist Sven Hedin, Obrutchev, Futterer, Holderer, and Deasy. Among the host of ardent explorers who have travelled in China since 1875 are Sosnovski, Baber, Gill, Széchényi (son of the great Hungarian patriot, Count Stephen Széchényi), Kreitner, Easton, Hosie, Colquhoun, Henry, and Younghusband. It is only since 1880 that the geography of Korea has emerged from its obscurity.

In the last quarter of the nineteenth century the dimensions of the unknown in Alaska, the Northwest Territories, and Labrador were vastly reduced by the explorations of Muir, Allen, Schwatka, Dawson, Ogilvie, Russell, Low, and others. In 1888 the first crossing of Greenland's great ice-cap (in its southern part) was accomplished by Nansen. In 1892 Peary and Astrup made a sledge journey of more than a thousand miles over the northern end, and determined the extension of the island in that direction. In 1893–5 the gap between the North Pole and the highest latitude ever before reached (Lockwood's 83 degrees 24 minutes in 1883) was bridged almost half over by Nansen's drift voyage and sledge journey, which carried him to the parallel of 86 degrees 14 minutes. This record was eclipsed in 1900 by the expedition of the Duke of the Abruzzi, which reached 86 degrees 33 minutes. The results of these expeditions render it improbable that any extensive land-mass remains undiscovered within the Arctic Circle. As the physical conditions prevailing at the North Pole cannot be materially different from those observed in the near vicinity, the reaching of the pole itself may now be regarded as a goal belonging to the realm of adventure rather than to that of scientific discovery.

In the same year in which Peary and Astrup crossed the fathomless ice-cap of Greenland the gigantic glaciers of the Karakorum were explored by Sir William Martin Conway, who climbed to an elevation of about 23,000 feet, eclipsing the record of all former travellers. In 1897 Aconcagua, probably the loftiest peak of the Andes, was scaled to its summit by Zur-

briggen, the Swiss guide, and Vines, the geologist of Fitzgerald's expedition, the elevation obtained for it by barometric measurement being 23,080 feet. In 1898 Conway accomplished the ascent of Illimani, one of the rivals of Aconcagua.

At the close of the nineteenth century the attention of the world was once more turned, after a long interval, to the Antarctic regions. The British expedition under Borchgrevink succeeded in locating the south magnetic pole, and attained to the parallel of 78 degrees 50 minutes, surpassing by 40 minutes the 'farthest south' achieved by Ross in 1842. Within the Antarctic Circle remains by far the greatest unknown area on the globe. Outside the polar realms the physical map of our planet, barring minor details, is nearly complete. When the nineteenth century opened geographical science had half a world to conquer. At its close this conquest may be said to be well-nigh achieved."

V

THE ENCYCLOPÆDIC EXPERT

At the inception of the New International Encyclopædia the publishers naturally turned to Mr. Heilprin for active coöperation in the undertaking. When a friend of his, hearing that President Gilman, of Johns Hopkins University, was to be editor-in-chief of the work, suggested to him that he advise the publishers to secure the services of Louis Heilprin as general reviser, and impress it upon them that there was no man in the world equal to him in this capacity, Mr. Gilman replied, "I have already written them all that, and more."

From the first Mr. Heilprin was entrusted with the revision of all the articles in proof, and he brought to his task the resources of a mind trained, as few ever were, for the harmonizing or correcting of statements covering so many fields of human activity. As before, various members of the family shared in Mr. Heilprin's labors, and perhaps only they can fully appreciate the magnitude of his performance. Of his tasks the verification of historical, geographical, and biographical data and the unification of the system of transliterating foreign names formed but a small part. His sensitive ear, aided by his marvellous memory, caught in any and every field of knowledge, as the proofs were being read to him, the slightest flaw in logic, the most deeply hidden contradiction between one writer and another. If in some article there occurred the statement that horses were used in Chaldea and Egypt for draught and riding, he remembered at once a confirmatory or, as the case may be, contradictory statement in a previous article under a different heading. If the article was one on "Savings Banks," or "Agriculture," the figures given under the New England States did not pass muster until he had cleared up the discrepancy be-

tween them and the corresponding statements (present to his mind) under Massachusetts, New Hampshire, etc. Such subjects as steam-engine or navigation found him in his element. There was incessant comparison back and forth, and not seldom did he reconcile conflicting statements that emanated from authorities of the highest professional standing. Even articles on subjects with which he was but little acquainted, relating, perhaps, to medicine, the drama, or music, would unexpectedly disclose inconsistencies or historical lapses that but for him might have remained undetected.

The nature of his work on Lippincott's Gazetteer, in conjunction with his brother, was no less exacting. It was for him not merely a question of writing and rewriting. His memory was ever on the alert for changes that were going on while the proofsheets were passing through his hands. Minnesota was outstripping Michigan in the output of iron, Germany eclipsing Great Britain in this or that industry, Ontario establishing a new record in the supply of nickel; a new lieutenant-governorship was created in the British possessions of Eastern Bengal; the Jungfrau railroad was approaching completion — all these and a thousand other new facts had to be thought of, and none escaped his vigilance. Needless to say that his brother Angelo, gifted with a scarcely less encyclopædic memory, shared equally in these labors.

Louis Heilprin has himself, however reluctantly, placed on record the clearest evidence of his encyclopædic knowledge, his sense of proportion, and his judgment of essentials, as opposed to the relatively unimportant, in three remarkable articles on the new edition of the Encyclopædia Britannica, which appeared in the *Evening Post* and the *Nation*. They were written while he was in the grip of a cruel and incurable disease, which constantly racked his frame. The articles were as follows:

The New Britannica

I

Never has the appearance of an encyclopædia, or indeed of any literary production, been heralded in the way in which the

new Britannica[1] has been announced in the United States. The American public has been overwhelmed with prospectuses and advertisements the style and manner of which have not invariably reflected credit on the University of Cambridge, under the name of whose press the eleventh edition of the Encyclopædia Britannica issues. A work has been promised incomparably superior to the old Britannica, one that would constitute a storehouse of the world's knowledge and a record of human achievement altogether unique. We have before us fourteen volumes out of the total number of twenty-eight (exclusive of the index volume), and a cursory examination shows that the new Britannica bears out the claims made for it by the publishers. They have produced a work of transcendent merit, one unapproached by any similar publication.

The last regular edition, the ninth, published by the Blacks of Edinburgh, appeared in twenty-four volumes, in the years 1875–88. The tenth edition, so-called, got up by the London *Times*, was made up of the ninth edition (unaltered) and eleven supplementary volumes. In discussing the merits of the present publication, we shall make comparisons with the ninth edition, ignoring the *Times's* supplement, which, to use the expression of Hugh Chisholm, the editor-in-chief of the work before us, was merely a "stop-gap." The lapse of three decades and a half between the publication of the first volume of an encyclopædia representing such a profitable undertaking as the Britannica and the appearance of a strictly new edition, argued a lack of enterprise and of regard for the fitness of things that was quite inexplicable. The publication of a greatly enlarged edition in such a way that the whole set could be brought out virtually at one issue without any portion being seriously antiquated, is a unique achievement in the history of the book-publishing business. The long delay that was interposed will inure to the benefit of the present generation of readers, which gets an encyclopædia entirely made over instead of one partly renovated.

The way in which the Britannica at the very high-tide of success was allowed to become thoroughly antiquated is not the only

[1] *The Encyclopædia Britannica:* A Dictionary of Arts, Sciences, Literature, and General Information. Eleventh edition. Vols. I–XIV. New York: Cambridge University Press.

curious episode of the kind in the recent history of encyclopædia-making. Equally inexplicable was the failure to keep up the American Cyclopædia (Appleton's), a work that had deservedly become a household treasure throughout the land. It is inconceivable how a publication so firmly established in the esteem of the people of the United States and capable of being reconstructed into an encyclopædia that would have been looked upon as a sort of national institution, almost like the Britannica, should have been thrown overboard for a successor of comparatively small merit bearing the title (Johnson's Universal Cyclopædia) of the publication which had come out in 1874 to dispute the field with the American Cyclopædia. Another instance of lack of enterprise was afforded by the publishers of Chambers's Encyclopædia, who, after bringing out an admirable work in the edition that appeared twenty years ago, failed to see their way to the publication of a first-class Anglo-American encyclopædia of moderate size for which that edition would have made an excellent foundation. The American Cyclopædia and the New International Encyclopædia, a work modelled largely on similar lines but much more comprehensive in its scope, are the only two general encyclopædias brought forth in the United States whose plan and execution have represented a serious endeavor to produce an imposing work of reference. The recently published Encyclopædia Americana, which contains about as much matter as the International, does not merit serious consideration.

Encyclopædia-making in Germany has long been at a stage that indicates a singular narrowness of vision on the part of publishers there. They appear to have no conception whatever of the possibilities open to them. Meyer and Brockhaus continue to travel along the same well-worn grooves, intent in their keen rivalry mainly on developing *à outrance* a rather uninspiring type of reference-book, half encyclopædia and half universal lexicon, overflowing with topics not to be found in any Anglo-Saxon encyclopædia, but almost destitute of the quality of readableness. The manner of treatment is largely standardized. Much dead and useless matter is carried along and the element of picturesqueness is sacrificed. The cut-and-dried manner of presentation leads to singular flaws. Who would have thought it possible, for instance, that both in Meyer and Brockhaus,

neither the name of Darwin nor the word *evolution* occurs in the article on Huxley? The tens of thousands of cross-references alone (a large proportion absolutely useless) take up so much space that the contributors in too many cases have no free hand in dealing with their topics. With respect to their comprehensiveness, we cannot, of course, deny that the German encyclopædias possess extraordinary merit. No conceivable kind of topic is permitted to escape their closely-meshed nets. They are universal question-answerers to a degree to which no encyclopædia that has ever appeared in an English-speaking country could lay claim. Yet we cannot help thinking that the German reading public would be better served if, instead of its all-embracing Konversations-Lexikon, it had a work constructed somewhat on the lines of the New International Encyclopædia (which contains approximately the same amount of text as Meyer or Brockhaus), whose pages are everywhere readable, and which, by husbanding its space, can afford to deal generously with many important topics but meagrely treated in the German encyclopædias. Where German enterprise shows to great advantage is in the frequent editions (with complete resetting of the work) of such a publication as Meyer and in its magnificent pictorial and cartographic equipment, far surpassing what the new Britannica or any other encyclopædia can offer.

In addition to the functions belonging to such a work as the International, the whole of whose contents is presumed to be not above the level of the comprehension of the ordinary intelligent reader, the Britannica assumes an additional function, that of introducing the special student in any branch of science to the intricacies of his subject and of presenting to him an exposition of the development which that branch of science has attained. It thus contains a large array of weighty scientific treatises, intended for the very few. Collectively, they render it an imposing monument to the sciences, one that shows the level that each has attained. This encyclopædia is, therefore, a mirror of the world's intellectual achievements in a sense in which the ordinary encyclopædia cannot profess to be. The discharge of this function, however, entails the failure of the Britannica in some measure to meet the fundamental requirements of a popular encyclopædia. The applicant for information or the seeker after

knowledge will often be turned away from its pages with his curiosity unsatisfied. Much of what the Britannica contains on physics and chemistry, for instance, will remain as heretofore a sealed book to many who come to learn out of its pages. But all this is in conformity with a deliberate plan. If the owner of the work is in quest of elementary information regarding heat, electricity, or light, for example, he will be told that the Britannica does not propose to lay before him the instruction that he can obtain from an ordinary school book. It would have been possible, perhaps, to adopt a double treatment in the case of many scientific articles, especially where mathematics enters largely into the subject, giving first a popular exposition, intelligible to the ordinary reader, and after that a full scientific compendium for the benefit of the specialist or the student who is able to follow intricate mathematical demonstrations. It is easy to see, however, that the preparation of such a composite article would in most cases not have been a very congenial task, or a very feasible one, for a scientific expounder.

The old Britannica, while it was a monumental structure, was only a half-fledged encyclopædia. The eleventh edition contains about fifty per cent. additional matter. Such a large increment, where the scale was already so generous, was deemed necessary as much in order to round out the work as to meet the demands made upon space by more than three decades of the world's progress and history. It would have been feasible by judicious excision and a more careful delimitation of spaces to avoid expansion on such a large scale without sacrificing anything of importance. We may as well be thankful, however, that there has been little condensation, for there is no more treacherous business than the condensing of articles in an encyclopædia. The most salient change is the introduction of the biographies of living people. To be compelled to pass judgment on the achievements and character of persons not yet deceased has hitherto been regarded as something not compatible with the legitimate functions of such an august publication as the Britannica. A more practical view has prevailed in the new edition, one of whose most valuable features is the collection of articles on contemporary celebrities. Nor will any part of the new matter be appreciated more highly than the biographies of the many

eminent personages who adorned the period in which the ninth edition appeared or who had achieved fame long before and still survived when the work reached their names in the alphabetical arrangement.

The old Britannica was constructed in large measure on the principle of relegating the treatment of specific topics to comprehensive articles, some of them long enough to make a good-sized book. The ninth edition started out, indeed, apparently without any conception as to how far this method might legitimately be carried, for in the article Agriculture a full and practical treatise on husbandry was presented to the British public, in which the various kinds of crops and of live stock were treated individually on a very extensive scale. The corresponding article in the present edition embraces only about one-third as much text, the material being placed where it properly belongs and where the user of the encyclopædia will naturally look for it. Thus, too, the specific information regarding the various chemical elements was before largely relegated to the article Chemistry. This feature of the Britannica impaired its value as a work of reference. The defect has been remedied in the eleventh edition, whose design conforms to that of ordinary encyclopædias with respect to the accessibility of the information that it contains. At the same time, the feature of long treatises, as we have seen, has not by any means been discarded. Many subjects, indeed, are treated at inordinate length, even for such a copious encyclopædia. An illustration of this is afforded by the article Hydraulics, covering seventy-six pages, in which the discussion of special problems having no important bearing is carried too far. An innovation is the introduction of purely lexicographic matter, which, in addition to scientific and technical information, affords much antiquarian lore culled from the most recent sources, such as the New English Dictionary.

The new Britannica can justly claim to be an Anglo-American encyclopædia, whereas the ninth edition was a British encyclopædia slightly Americanized. The article Agriculture contained no reference whatever to American conditions. The article Railway allowed barely three pages to the United States out of a total of thirty-two. In the eleventh edition, this topic, as far as economic aspects are concerned, was entrusted to the

great American authority, President Hadley. In the twenty-eight-page-article on Music there was no allusion to American musicians or composers. Of course, there was no blame to be attached to the editors of the old Britannica in every instance of the kind here mentioned, as they did not profess to go out of their way in order to make their work especially adapted to the American market. Their remissness with respect to the United States took the shape, however, in places of adding insult to neglect. The article Horse contained the following: "The development of speed in the trotting-horse . . . is one of the great industries of the United States of America." We wonder where the writer of the article Bison in the ninth edition got his information that the animal was sometimes ("rarely") found "to the east of the Appalachian range." The proofreaders of the old Britannica need not have been quite so ignorant of American geography as to allow "the St. Louis bridge at Cincinnati" (in the article Bridges) to pass uncorrected. But, then, we must remember that it was a fashionable error in England at the time of our civil war to believe that the Mississippi River was the boundary between the North and the South. The sins of former British encyclopædists in matters American are only on a par with those committed by such painstaking encyclopædists as the Germans. Brockhaus, in its latest edition (the fourteenth), still informs its readers that Mt. Vernon, N. Y., is the place where Washington had his country seat and where he was buried. Both Brockhaus and Meyer strive to be pretty full with respect to American biography, but neither has ever heard of Chief Justice Marshall.

In the eleventh edition of the Britannica a favored position is accorded to the United States. There is no general encyclopædia of recent date that contains such full biographies of Americans, although in the matter of inclusion the line has naturally been drawn much closer than in the International. For our part, we should have preferred to see the standard of inclusion set higher than it has been. A detailed biography of Mrs. Eaton ("Peggy O'Neill"), whose tribulations caused so much trouble in Jackson's first administration, mars a work like the Britannica. Timothy Dexter, soldier and crank, to whom nearly a column is devoted, might likewise well have

been spared. The history and politics of the United States are generously dealt with, and the geography of our country leaves nothing to be desired on the score of fulness. The articles on the very small towns in the United States are even on such a scale as to disturb the symmetry of the work. Of course, in most departments the process of Americanization could by no means be carried out so effectually as in those of biography, history, and geography. In the case of a great many subjects, as, for example, legal topics, the introduction of information regarding the United States on a scale required in an American publication would have marred the articles as contributions to a British encyclopædia. That full justice is not always done to the United States even where there was nothing to prevent is exemplified in the article Aqueduct, in which there is no mention of the new aqueduct that the city of New York is constructing, which will dwarf every work of the kind, ancient or modern, into insignificance; or of the Los Angeles aqueduct, which will be by far the longest in the world. This article was contributed by several writers, and the section on modern aqueducts was assigned to a member of a firm of civil engineers in London, who shows by the amount of attention that he bestows upon iron and wooden conduits his unfitness to deal with the broad aspects of his subject — an illustration of the peculiar need of caution that should be exercised by the editor of an encyclopædia in entrusting technological articles to practical men. The article Canal does not concern itself with canals in the United States, although the Erie Canal is the longest artificial waterway in the world. The article Irrigation (13 pages) deals at length with the reclamation work prosecuted on such a vast scale by the United States government, but gives no idea of the extraordinary character of some of the engineering achievements.

A curious feature of the old Britannica was its neglect of military history. There were no articles on such subjects as the Seven Years' War or the Thirty Years' War, and famous battlefields were for the most part omitted if the place from which the engagement took its name was in itself unimportant. There was no such caption as Dettingen or Hohenlinden, Bull Run or Chancellorsville. The Londoner whose daily walk took him past the Nelson Monument might look in vain for Trafalgar.

The new Britannica devotes an amount of space to wars and battles that would make in itself a large volume on military history. We cannot help feeling, indeed, that this feature is exaggerated. Eighteen and a half quarto pages devoted to the Great Rebellion in England is too much even for an encyclopædia that has almost boundless space at its command. In the various ways which we have indicated and in many other respects the eleventh edition of the Britannica is an immense advance beyond the ninth. But the new work is cast in the pattern of the old and breathes the same spirit, even if in some ways a concession is made to demands hitherto regarded as too plebeian to claim recognition.

As the Britannica has always been so strong on the scientific side, while maintaining the traditions of old-time culture, one does not have to discern in the new edition any particular change of complexion that would reflect the retrusion of the cult of letters by that of the arts and sciences which has characterized the world's intellectual development in the course of the last generation. A glance at the list of leading articles (with the names of the contributors) prefixed to each volume will show that the Britannica remains as much as ever a scholar's encyclopædia in the face of the innovations required to make it a practical work of reference. While pulsating with the activities of modern research, it continues to exhale the atmosphere of the old scholastic halls. Many of the fine essays written for previous editions have, as a matter of course, been retained virtually unchanged, or but slightly altered. The impressive monograph on Descartes, for example, contributed by William Wallace to the ninth edition, reappears with little change in the eleventh. So, too, Jebb's Demosthenes. Possessors of the new Britannica will enjoy reading Macaulay's life of Goldsmith, which has done such good service in previous editions and which is reproduced "slightly revised" by Austin Dobson. Dickens, who appeared for the first time in the ninth edition, has his life retold and his writings subjected to a fresh criticism by Thomas Seccombe.

II

A little ramble through one of the volumes of the new Britannica, with the ninth edition at our side, will serve to show the nature of the change undergone in the transition from the encyclopædia of 1875–1888 to that of 1911. Let us glance, for example, at the section comprised under the initial *In*. Between the captions Inchbald and Independents in the old Britannica we find just two lines, consisting of cross-references from Incubation to Birds, Reproduction, and Poultry (the last not justified). In the eleventh edition, nineteen pages have been introduced at this place. They include Inclinometer (instrument for measuring the dip of the magnetic needle), Income Tax, Incubation and Incubators (comprising Bird Incubation, Bacteriological Incubation, and Human Incubation), Incunabula, Independence (a small city of Missouri whose history is given in great detail), and Independence (Declaration of), besides several minor biographical, legal, and scientific articles. Index Librorum Prohibitorum has been rewritten and the information brought down to the doings of Pius X. The extensive article on India contributed to the ninth edition by W. W. Hunter, author of the monumental "Imperial Gazetteer of India," has been essentially retained in an abridged form, a section having been added on the costumes of the peoples of India. There is an article of six pages on Indian Architecture, a topic absent in the ninth edition, except in so far as it figures in the general treatise on architecture. Sir William Markby contributes a weighty article (12½ pages) on Indian Law, divided into two sections: Hindu Law and Mahommedan Law. What corresponds to this in the old Britannica is just one page on Hindu Law, under India. In place of the rather brief account of the Sepoy Mutiny given before under India, we have now a separate article, Indian Mutiny (4½ pages). To Indiana, which occupied less than two pages in the ninth edition (where the historical information terminated with the admission of the State into the Union), are accorded five and a half pages in the eleventh edition. Indians (North American) covers three times as much space as it did before, no less than thirty-

one pages being devoted to the subject, which is treated in a remarkably comprehensive manner by Professor Chamberlain of Clark University. Among the many new topics that figure in the succeeding fifty pages are Indo-Aryan Languages, Indo-China (French), Induction Coil, Inebriety (Law of), Infallibility, Infancy, and Infantry. The last-named occupies sixteen pages, whereas in the ninth edition there was no such article, the subject having been relegated to the article War, where only three pages were devoted to it. The article Inquisition (9 pages), by P. D. Alphandéry, professor at the Sorbonne, has taken the place of a much shorter one. Prominence is given in the bibliography to the writings of Henry C. Lea, whom Professor G. E. Woodberry has strangely overlooked among recent historians in his fine article on American Literature. Insanity (21 pages) has a new feature in the section on Hospital Treatment, contributed by Professor Frederick Peterson of Columbia. Insectivora represents a topic not treated under its own head in the old Britannica. The article Instinct, contributed to the ninth edition by Romanes, has been supplanted by one from the pen of another authority on this baffling subject, Professor C. L. Morgan, who has also an article on Intelligence in Animals, a new topic in the eleventh edition. Instrumentation (4½ pages) is only one among many new articles in the department of music. The subject of International Law is presented afresh by Sir Thomas Barclay, who asserts that the chief source of such law will "in all probability for the future be that 'Parliament of Mankind, the Hague Conferences.'" This article is followed by one on Private International Law, in regard to which subject the old Britannica was silent. Interpolation (4½ pages) illustrates the expansion of the mathematical department. Close upon this comes a strictly American topic, which did not admit of treatment in the ninth edition, Interstate Commerce, occupying three pages.

To take a single department by itself, a glance at the fresh historical contributions will give an idea of the splendid scale on which the work of remaking the Britannica has been executed. The history of England, France, Germany, and Austria-Hungary from the time where the record closed in the ninth edition occupies collectively seventy pages, which would make a

duodecimo volume of about 350 pages. Sixteen pages are devoted to Egypt since the deposition of Ismail Pasha. The eventful past of Bohemia occupies nearly ten pages, where the old Britannica had barely a column. One of the weightiest contributions in this department is Caliphate (31 pages), from the pen of the eminent Arabic scholar, Jan de Goeje.

The editing of the eleventh edition under the conditions that governed its production was a Herculean task, and the undertaking has been successfully accomplished. This does not imply that the manifold problems that confront the editor of a great encyclopædia were everywhere successfully solved. The norms that have to be set in the execution of such a work are so numerous and so hard to establish, and the difficulty of getting contributors to execute their tasks in a way conformable to the system and requirements of the publication is so great, that even where seemingly boundless pecuniary resources have been placed at the command of the editor, the result will still be far from perfection. By the side of the most skilful constructive editorship there is need of a rectifying department, more or less destructive in its functions, that shall guard at every step against defects, incongruities, absurdities, mistakes, and blemishes, and shall not concern itself with anything else. The editors of encyclopædias have been loath to recognize this necessity, having no adequate conception of the pitfalls that beset them at every turn and not being prepared to encounter the delays, vexation, and expenditure entailed by a thorough system of rectification and verification, which indeed it is not an easy matter to install. Such super-editorship, imposed upon the constructive editorship, does not appear to have been part of the apparatus in the production of the magnificent work before us. As a matter of fact, it could hardly have been introduced in the required form under the stress involved in the feature of simultaneous publication. The following are examples of various kinds of shortcomings detected in turning the pages of the volumes before us.

The ninth edition contained under the title Dictionary a list of dictionaries of the principal languages of the world, occupying several closely-printed pages. It was an absurd performance. The place for such information is, of course, in the

individual articles on the various languages. It was a great blunder to retain this useless compilation. But the worst of it is that it stands here but slightly altered, with its absurdities and mistakes reproduced. The places where the dictionaries were published are generally given in the form in which they appeared on the title-page or in the books from which this list was compiled, and frequently also in the English form. We have, therefore, Stockholm, Holm, Holmiae; Haag, La Haye, 's Gravenhage; Moskau, Moskva, Mosque; Bucharest, Bucuresci, Boucourest, Boucoureshti. The learned compiler made no effort, of course, to disentangle the names from their inflectional or post-positional endings. Budân (misprint for Budán) is the Magyar for "at Buda," and Kassan for "at Kassa (Kaschau)." The Gipsy and Albanian languages continue to figure here under the Ugrian tongues, although their Indo-European character has been well established. It is evident from the scholarly article on Gipsies by Rabbi Moses Gaster (6 pages) that there is no longer any doubt regarding the Indian (Hindu) origin of the Gipsy dialects. Under Dial we are told that "in the eighteenth century clocks and watches began to supersede sun-dials," a very misleading statement. In close proximity to this profound treatise on a subject that will appeal to but very few, is the shallow article on Porfirio Diaz, in which the treaty of Guadalupe-Hidalgo is spoken of as having transferred Texas to the United States, in place of New Mexico and California. The article Ink is so largely reproduced from the ninth edition that we have serious doubts as to its being up to date. It is certainly queer to see the following passage in the paragraph on Logwood Ink appear again after an interval of just thirty years: "It is affirmed by Viedt that this drawback may be overcome by the use of soda." The article on Eagle adduces the authority of Pallas for the statement that the *bergut*, a species used by the Kirghiz Tartars for the capture of antelopes, foxes, and wolves [!], is "valued at the price of two camels." The eminent naturalist here quoted as though he had just been writing on the subject died precisely one hundred years ago. Some one of the readers of the galleys who allowed this to pass ought at least to have been bold enough to excise from the article Eskimo the tribute paid to the voracity of this

Hyperborean folk (a relic of the old Britannica), to the effect that "two will easily dispose of a seal at a sitting."

The article Aeronautics, occupying ten pages, devotes only a little more than a page to dirigible balloons, the construction of which is not adequately described; nor is the information up to date (although the illustrations are), as any one can tell by glancing over the table giving the performances of such balloons. The page of mathematical formulæ, etc., near the beginning of the article should have been placed under Flight and Flying. In the lengthy article on this latter subject, which is made up of Pettigrew's treatise on Flight in the ninth edition and a full and up-to-date account of what has been achieved in aviation, it is amazing to find entire passages about models of flying machines reproduced from the old article without any change of tense in statements made above thirty years ago — statements utterly valueless now — as, for example: "Pénaud calculates that one horse-power would elevate and support 85 lbs." This article is defective in containing no actual presentation of the theory of the aeroplane. In the table at the end the Wright brothers are not credited with the remarkable flights mentioned in the text as having been performed by them in 1904 and 1905, which made them the first successful aviators. Under the head of Gothic, we are told that it is "the term generally applied to mediæval architecture, and more especially to that in which the pointed arch appears." As though Byzantine architecture and Saracenic architecture were not mediæval. Then we read that some of the Goths "(the East Goths, or Ostrogoths), settled in the eastern portion of Europe, and others (the West Goths, or Visigoths), in the Asturias of Spain." The presence of such an egregious misstatement (tucked away in an unobtrusive little lexicographic article), which ought not to have escaped the eye of any reader of the proof having some knowledge of mediæval history, shows what flaws the editor of an encyclopædia may expect to creep into his work through the lack of ubiquitous oversight.

The spirited sketch of the events of the last thirty years in the article on Ireland takes seven pages. The history of the preceding eighty years, from the rebellion of 1798 to the establishment of the Irish Land League, reproduced from the ninth

edition, occupies only about a page, so that the proportions of the article are badly distorted. A considerable section of the old article should, of course, have been recast and expanded from a very brief recital — in which, for example, the name of Gladstone does not occur — into a narrative sufficiently detailed not to be altogether incompatible with the section that has been appended. This subject opens up a broad vista in the intricacies of encyclopædia-editing. Bolgari, the capital of the northern Bulgarians, was not captured by Tamerlane early in the fourteenth century, but at its close. The Black Sea is not bounded on the east by Asia Minor, but by Transcaucasia. The biographer of Bismarck speaks of Hesse-Cassel and Hesse-Nassau as having been taken by Prussia after the war of 1866, where he should have said Hesse-Cassel and Nassau. In the article Electors, one of those contributions that evince the fulness with which mediæval institutions are treated in the Britannica, some mention should have been made of the fact that the ruler of Bohemia, one of the seven electors recognized in the Golden Bull of 1356, exercised his right to vote only for a short time after the publication of that instrument, so that the number of princes who participated in the election of the Holy Roman Emperor was actually reduced to six. There is no article on Embargo in United States history. In the biography of W. S. Hancock the electoral vote at the Presidential election should have been given.

The article Iceberg is too meagre, nothing being said about the dimensions of some of the huge floating islands of ice, the possibility (or impossibility) of detecting the presence of icebergs in a fog, etc. Again, under Glacier no mention is made of the size of such vast glaciers as the Muir or Humboldt. Ice-yachting, which is described in an article well up to date, and naturally devoted largely to the United States, contains an explanation of the paradox of sailing faster than the wind (taken from an article in the Badminton Library) which sounds strange to any one familiar with the first principles of dynamics. Having touched upon the subject of sport, in which field the new Britannica is as exhaustive as in every other, we cannot refrain from saying that in the article Golf the long list of successful British champions, male and female (brought down

to 1910), is not in keeping with the dignity of this encyclopædia. Much more undignified still is the reproduction of some of our college yells in the article Cheering. In the excellent article on Lake Erie there is no mention made of Perry's victory in the naval encounter which has passed into history under the name of the Battle of Lake Erie. We fail to see why such thoroughly Austrian literary personages as Grillparzer (who has, however, a very good biography) and Gindely should be called German. The designation of Ebner-Eschenbach as an Austrian novelist shows in any case a lack of consistency. It is regrettable that the subject of Insectivorous Plants has been virtually eliminated as a separate topic, the reader being referred to the articles on the various plants to whose diet insects contribute. This interesting theme called emphatically for collective treatment, admitting of a general discussion, even at the cost of considerable repetition. In the biography of Gustavus Adolphus the date of the battle of Breitenfeld (Leipzig), in which the Swedish monarch vanquished Tilly (September 17, 1631), is given according to the new style (Gregorian calendar), and that of the battle of Lützen, in which he fell fighting Wallenstein (November 6, 1632), according to the old style.

The Spanish philosopher Balmes figures under the French form of his name, a grave accent, which does not exist in Spanish, being placed over the *e*. The article Giraffe, whose up-to-date character is attested by the mention of that recently discovered relative, the okapi, is singularly brief, even the height of this tallest of mammals not being stated. In the section of the article Hydraulics dealing with frictional resistance (Vol. XIV, pp. 58, 59), whole strings of figures are made a hundredfold too large through the displacement of the decimal point, an error brought over from the ninth edition. The subject of the homing instinct of animals, briefly discussed in the ninth edition in the article Instinct, does not appear to be dealt with anywhere in the work before us. A serious omission in the geographical department is that of the town of Cobalt, the centre of the rich silver-producing district of Canada. Amarillo, the metropolis of the Texan Panhandle, and the bustling town of Globe, in the copper district of Arizona, have likewise been overlooked. There is no such caption as Colosseum (Coliseum).

The proof-sheets of the Britannica have not been subjected to a sufficient scrutiny with reference to the elimination of ordinary misprints. The publication, therefore, lacks that distinguished character of being a monument of the printer's craft which belonged to the American Cyclopædia, whose pages were read and reread until every typographical blemish, it may almost be said, had been removed. Under Glass (stained), we find Toldeo for Toledo; under Granaries (in the topographical plan), Victorio Docks; under Indians, Alonkian for Algonkian; under Inquisition, Gius for Pius; under Gundulich (bibliography), "last cantos" for "lost cantos." Under Ireland, we find Poynings's Act (p. 773), and Poyning's law (pp. 779, 780). The titles of books in foreign languages, it must be said, are very correctly printed.

A singular exhibition of lack of judgment has introduced a blemish into the new Britannica which, to some of its readers, will be very irritating. An editorial ordinance appears to have gone forth to the effect that whenever reference is made in an article to a writer or a scientist his initials must be prefixed to his surname. Thus in the article Dynamics, Helmholtz has to figure as H. F. L. Helmholtz, and Lagrange as J. L. Lagrange. Under Hydrogen, we have to read of H. Cavendish and A. L. Lavoisier; under Entomology, of C. Darwin; under Huxley, of J. W. Goethe. Such introduction of the initials is calculated to have the effect of misleading the reader, who is apt to imagine that the person mentioned is other than the famous individual of the name. But what makes the whole thing vicious, in addition to its being ridiculous, is the fact that in the case of a great many European celebrities who have several Christian names, there is one particular name by which the personage is known and which alone usually accompanies the surname.

The ample bibliographies constitute a prominent feature of the new Britannica, but one which in our opinion is altogether overdone. The references, for example, appended to the biographies of mediæval rulers are largely of little practical value. Take, for example, the German sovereigns who bore the name of Conrad. Their history is the history of Germany, and the student in quest of authorities ought to know enough to consult

the list of books on mediæval German history given in the article Germany.

The illustrations and maps in these volumes vary greatly in merit. It appears to us that the half-tone process might have been made to yield much better results.

It is an easy matter to pick flaws in a vast encyclopædic publication, however great may be its merits. Such pointing out of defects in the new Britannica is not meant to be taken as a serious disparagement of the character of the work. The Encyclopædia Britannica, in its latest form, is a monument to the learning of the Anglo-Saxon race such as no other people has ever reared to itself.

III

Although the circumstance that all the volumes of the new Britannica were prepared simultaneously ought to render it unnecessary to make any special comment upon the contents of the second half of the work, issued within a few months of the first, still it would be ungracious to leave the concluding fourteen volumes altogether unnoticed. To pick out a miscellaneous handful from the imposing array of new articles on old subjects whose presence or extent evinces the enlarged scope and greater fulness of this edition as compared with its predecessor, mention may be made of Ship, Railways, Water Supply, Painting, Museums of Art, Theatre, Temple, Vision, Spinal Cord, Map, Logic, Rumania, Magnetism (Terrestrial), Tool, Typography, Lighthouse, Lighting, Ordnance, Polar Regions, Trade Unions, Strikes and Lockouts, Papacy, Liquor Laws, Japan, Song, Metternich, Picaresque, Novel, Science, Leviticus, Textual Criticism.

The article Ship fills 62 pages, besides 28 pages of plates. Here we find on turning to the ninth edition (the "tenth" edition was merely the ninth edition plus a huge supplement) one of those extraordinary lapses that marked the nonchalant spirit of the old Britannica, whose failings were on a par with its transcendent qualities. The subject was disposed of in just five pages. These five pages contained a good deal of scholarly information about the war vessels of the Greeks and Romans,

and something about the mediæval galleys, and there the story abruptly ended. To add insult to such outrage, a table was inserted in the article, borrowed from a learned German antiquary, which would lead the untutored reader to imagine that the ancients had ships of war nearly as big as Queen Victoria's battleships. Of course, there was an article on Shipbuilding, but this did not contain the information that was so mysteriously absent under Ship. The new article on Shipbuilding is four times as long as the old one, covering 57 pages, besides 13 pages of plates. It is in great part a sealed book to all but advanced students of marine engineering, and, if the truth has to be told, one would almost be glad to barter it for the sixteen-page article on Seamanship in the ninth edition, still reflecting the spirit of the romantic days of wooden ships. The subject of Sea-Power, hitherto ignored, is discussed in a twelve-page article by Sir Cyprian Bridge. Another maritime topic not represented in the old Britannica is Steamship Lines, occupying 11 pages of small type. Shipping (5 pages) gives statistics of the commercial navies of the world. These various articles on naval matters, with the addition of the eighteen-page article on Navy and Navies (defective in the scant reference to the Italian republics and in the inadequate history of our navy) and the 14 pages on Navigation, would make about 1,000 duodecimo pages.

By the side of all this, the article on Railways (42 pages, the equivalent of about 250 duodecimo pages), although it is twice as long as the one in the ninth edition, which did not concern itself with railway legislation and, among other things, omitted the whole subject of train resistance, strikes one as being too brief. This impression is strengthened when we come to the section on construction, the author of which ought to have indulged in the recital of the great epic of railway engineering from the Stephensons and I. K. Brunel down to Harriman's levelling of the Rocky Mountains to a gentle gradient, the piercing of the Simplon, and the subaqueous creations about Manhattan. The interesting subject of the interchange of freight cars is not discussed in the article. The lengthy section dealing with locomotive power, which contains nearly all that the Britannica has to say about steam locomotives — there being

no separate article on the subject (not even a cross-reference under Locomotive!) and less than a page on it under Steam Engine — should have dealt more fully with the anatomy of the various types of engines and reproduced pictorially some of the forms from the little four-wheelers of the early days to the leviathans of the Santa Fé.

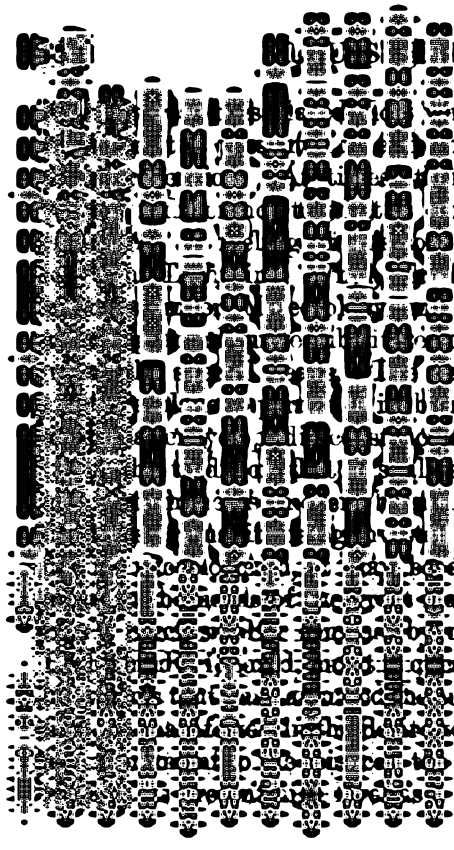
In a publication claiming to be an Anglo-American encyclopædia (a claim fully justified with respect to the departments of geography, biography, and history) space should have been found for the early history of railway construction in the United States. In the section on railway accidents, the United States figures in a gruesome way. That numerous class of legislators, who, yielding to popular clamor, are intent upon keeping rates below the level at which our railways could afford to bring their physical condition up to the requirements of safety, should ponder the figures here given. We may also observe that the inadequate biographies of George and Robert Stephenson have passed from the ninth into the eleventh edition.

The new Britannica has an article of 59 pages on Painting, the joint contribution of several writers. Schools of Painting in the ninth edition, covering nearly the same ground, filled only about one-fourth of the space. The United States has not been generously dealt with here, receiving less than a page. Rumania (24 pages) occupies about four times as much space as it had in the ninth edition, which took the liberty of omitting the literature of the country. The shifting of the relative importance of geographico-historical subjects is well exemplified in the articles on Japan and Persia. Japan has 119 pages in the eleventh edition (about as much as the United States), and Persia 65; in the ninth edition, Persia had 100 and Japan 23. One's sense of proportion is offended on discovering that the Transvaal has a longer article than Bohemia or Sicily. Prominent among the articles on celebrities who have but recently passed away is the eight-page essay on Tolstoy, by C. T. H. Wright, librarian of the London Library. The old Britannica was niggardly in its treatment of the labor problem. It had only 3 pages on Trade Unionism, a subject now covering a dozen larger pages, which still appears too little for an encyclopædia that can afford to give 15 pages to Plate, 10 to Lace, and nearly

12 to Totemism. We have 14 pages on Strikes and Lockouts, where there was no such caption before. Labor Legislation (21 pages) is more than twice as long as the corresponding article in the ninth edition. It is regrettable that the article on Socialism, from the able pen of James Bonar (not quite 8 pages), is much shorter than the one it has supplanted. The article Negro in the ninth edition, a very unsympathetic production, has been superseded by a longer one, conceived in a more humane spirit. The fulness of the new Britannica in everything pertaining to war is not calculated to reassure those who believe that *aspera mitescent sæcula*. Ordnance, for example, has 47 pages, or nearly three times as much space as was occupied by the corresponding article, Gunmaking, in the ninth edition. It is gratifying, however, to discover that the longest biography in the Encyclopædia Britannica belongs no longer to Mars, but to the Muses, Napoleon having been dethroned by Shakespeare. A serious omission is the absence of an article on the Peasants' War. The subject of Peace is discussed by Sir Thomas Barclay, who has hopes of a brighter future for the world, in spite of Nietzsche's rhapsody about war reproduced at the end of the article. Those people who cannot get themselves wrought up by Italy's dastardly breach of the peace, on the ground that the Turks are a nation undeserving of sympathy, would be edified if they happened to light upon the following passage in the article on International Law, contributed by the same distinguished publicist to the new Britannica:

> Turkey too has the advantage of possessing a code of morals which produces so high a standard of right conduct in private life that very little in the way of moral lessons will have to be learned by the Ottomans from Western civilization.

The more closely one examines the fabric of the splendid work before us, the more clearly is its dual character brought into relief. It is a vast storehouse of information for all people of culture, upon which is reared an imposing superstructure, accessible only to a few, comprising the weightiest elements in the whole edifice — the lengthy scientific treatises designed for the specialist. Much of what might be put within the reach of the



ILPRIN

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VI

LAST CONTRIBUTION TO THE *EVENING POST*

The last of the articles on the Britannica appeared in the *Nation* and the *Evening Post* during October, 1911. In the same month the *Post* published his last editorial contribution, the following article on "The Tenacious Ottoman Empire":

"There has not been much talk for some time past of the expulsion of the Turk from Europe. A little while ago it was a common notion that his realm could not endure much longer. But with the reverses and internal convulsions of Russia, the lull in the region of the Balkans, and the rise of a Young Turkey, the situation changed. The sudden assault that we are now witnessing from a new quarter tends, of course, to bring about a revival of the old feeling. But it is easy to overrate the importance which such an act of spoliation as the seizure of Tripoli would have with reference to the stability of the Ottoman Empire. Turkey has survived a great many shocks. She bids fair to hold her place on the map of Europe and Asia. What does her history teach us?

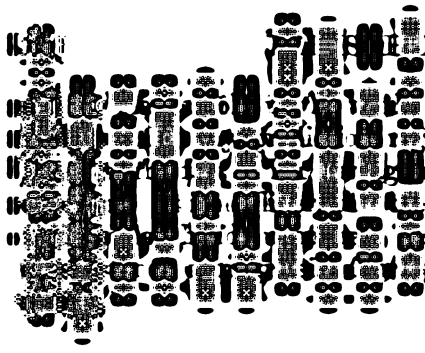
Just two hundred years have elapsed since the army of Peter the Great, in the summer of 1711, found itself hemmed in on the bank of the River Pruth by the forces of the Turkish Sultan, whom Charles XII of Sweden, after his overthrow at Poltava, had induced to take up arms against Russia. The Czar was allowed to escape on condition of relinquishing the seaport of Azov, in the land of the Tartars, whose capture had been the first achievement of the infant Russian navy. It was Peter the Great who launched Russia upon her career of warfare against the Ottoman Empire. Seven wars have been waged between his successors and the Turkish Sultans, in the last of which the

Russian hosts advanced to the very gates of Constantinople. When Russia entered the lists, Turkey was reeling under the combined onslaughts of Austria, Poland, and Venice. The blow dealt the Moslems under the walls of Vienna in 1683 liberated Europe forever from the aggressions of Islam, and the mighty fabric reared by Othman and his successors was crumbling away. Under the Empress Catharine II. Russia assumed the rôle — a rôle which she was soon permitted to reserve entirely to herself — of dismemberer of the Ottoman realm, whose dissolution in the near future was freely predicted. It became an article of faith with Russian patriots that the 'White Czar' would be enthroned on the Bosporus. Catharine made Russia a power on the Black Sea. By 1812 the boundaries of Muscovy had been advanced to the Pruth.

A few years before this the disruption of the Turkish Empire from within had been initiated by the rising of the Servians. Then came the Greek revolution. Meanwhile, Egypt, under Mehemet Ali, had been cutting loose from Constantinople. In 1829 the Russian forces entered Adrianople, and the treaty dictated there gave Russia a protectorate over Moldavia and Wallachia. Turkey was going to pieces. But there was to be a respite. England could not brook Russia's establishing herself as a Mediterranean Power, and Russian expansion was a menace to British dominion in India. In 1853 Czar Nicholas I. told Sir Hamilton Seymour, the British Ambassador, that the 'sick man' was dying; Nicholas had persuaded himself that the time was opportune for another advance in the direction of Constantinople. He did not gauge the temper of the British nation, could not foresee that an enemy would arise in the shape of a French usurper, and failed to reckon with Austrian ingratitude. Turkey was saved and Russia humbled. Another twenty years elapsed. Then Russia made a more powerful onslaught than ever before upon the Moslems. She rent European Turkey asunder. But after the lapse of a generation the Ottoman Empire still stood firm, with its seats on the European side of the Bosporus. Russia's own creations are in the way of her ever getting to Constantinople. The Powers are not inclined to disturb the present situation.

The fact is that the world has all along been laboring more or

less under an illusion in imagining that the dismemberment of Turkey meant speedy disruption and dissolution. For two hundred years Turkey has been parting with her conquests, but the wresting from her of province after province has left the core of the empire intact. What was properly Turkey remains in the possession of the Turks. The Ottomans continue to be masters of almost the entire territory ever occupied by them as dwellers on the soil. In yielding up their conquests, they have not parted with their strength. The extension of Turkish dominion after the conquest of Constantinople in 1453 was not accompanied by any great spread of the Turkish population over the annexed regions. There was at no time any considerable fraction of the Osmanlis living beyond the present limits of the empire. The conquerors were not inclined to settle down in large numbers in the midst of the subjugated peoples. Even while the crescent was floating over the battlements of Buda, the ancient seat of the Hungarian rulers, the Turks barely strayed northward beyond the slopes of the Balkan Mountains. The Servians were trampled under foot by their Mohammedan masters, but they did not have very many of them dwelling in their midst. Bosnia, it is true, was in a considerable measure Mohammedanized, but the Moslem element there is mainly Slavic, the ruling class having centuries ago embraced Islam in order to safeguard its power. Two centuries of Turkish rule in the heart of Hungary left little trace of foreign occupation. The Turks made no attempt to assimilate or absorb the subjugated race or to supplant the Bible with the Koran. One after another, the Christian peoples conquered by the Sultans have emerged from the wreck of Ottoman dominion in full nationality; but so has the Turkish race remained intact. The territories that the Osmanlis converted into their fatherland were conquered in the first century and a half of their existence as a nation, and nearly the whole of this region they still retain. Under these conditions, there is no telling how long their state may survive. When the Ottoman Empire was at the zenith of its power, Spain was at the zenith of hers. She was the most powerful state in Christendom. She has gone the way of Turkey, having been stripped of all the possessions that constituted her political greatness. But Spain lives on and means



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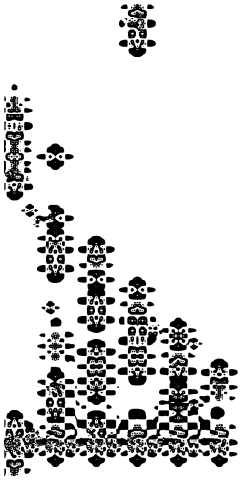

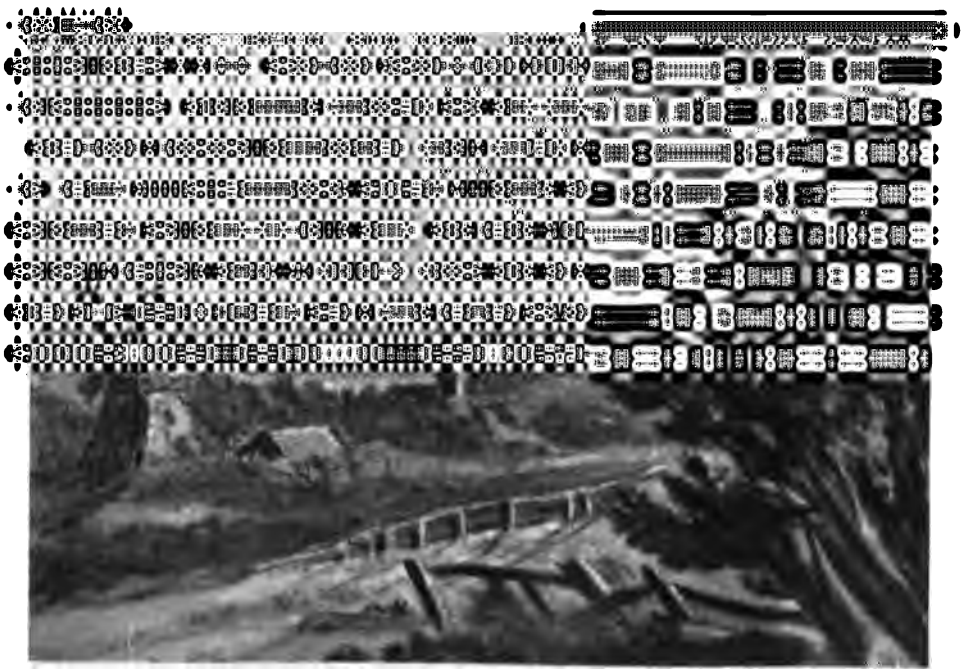

A Crayon Sketch by Louis Heilprin

VII

LOUIS HEILPRIN, THE MAN

Louis Heilprin expired peacefully, after great suffering borne with heroic fortitude, on February 12, 1912. He was in his sixty-first year. At his funeral, which took place from the house of his sister, Mrs. A. P. Loveman, Mr. Rollo Ogden, the editor of the *Evening Post*, and Mr. Louis E. Levy expressed their sense of his worth.

Thus closed a life to which came few of the ordinary tokens of outward success, but which was rich in satisfactions of a deeper nature. The very physical defect which closed to him the avenues that lead less gifted men to fame and fortune had its compensating side. Even apart from training his memory to an almost incredible extent — he had literally tens of thousands of historical dates at his fingers' ends — the weakness of his eyes had some compensations; it certainly interfered not in the least with his enjoyment of the world around him. He saw more of the beauties of a landscape and even of its details than most persons of sound sight. In dwelling, with his glowing enthusiasm, on the charms of nature, or on certain architectural features of city life, or on some details of engineering construction, he seemed to be possessed of an inward faculty of seizing the salient features of what was before him that served the purposes of normal vision. How he turned out, as he did in great profusion (especially in his last years), the dainty and artistic crayon sketches, of landscapes seen only by his imagination, that were the delight of his friends, was a constant mystery to them as well as to one or two art critics who happened to notice his work — always performed hurriedly, to spare his eyes, and offered, as a gift, with engaging shyness.

How he studied, and acquired his vast stores of knowledge,

was scarcely less mysterious. He never spoke of what he was doing. Language after language was acquired, at odd moments, in the privacy of his room — how many in all no one ever knew. Late in life he even added a little Japanese. "It is one's duty to know nowadays something of that country," he remarked, in extenuation, as it were, of his presumptuousness in tackling the Oriental tongue. Hebrew he also studied, to some extent, late in life, probably in deference to the memory of his father, whom he revered, and after whom he wished to model his life. A stoic all his life, the death of any member of the family scarcely drew a tear from him. His inborn modesty and constant self-restraint suppressed, if it ever existed in him, the desire to give, in ordinary conversation, an inkling of the thoughts that crowded his brain. He was not ever eloquent as his father, nor as uniformly communicative as was his brother, but his friends and it may be occasional strangers were ever and anon carried along by those streams of information that ceased to be surprising only because they flowed so spontaneously and freely. And, again, it became a matter of wonder how this plain, unassuming man, of quiet demeanor and simple language, never failed to impress himself upon strangers, whatever their station. All were alike drawn to him and recognized him as a remarkable man. His goodness was as transparent as the wealth of his knowledge. He had no thought of self in what he did and said. Duty — to his fellowmen, the state, the family — guided him at every step of his life. He seemed to possess a real affinity for suffering or needy humanity, and was sought out, with almost ludicrous regularity, by persons in want, whether on his solitary rambles through the country, or an evening stroll through city streets, or in travelling on a railroad train. Somehow, those in trouble naturally turned to him, and he never failed to respond, helping not only with money, but going miles out of his way to pilot an uncertain wayfarer to his destination. In his modest annual budget the first place was given to charity, then came contributions for public purposes. For purely personal pleasures, aside from books, there was neither time nor money. But no one devoted more time and thought to civic matters. He kept abreast of all the important national and municipal questions, and at election time he sought information from every quarter concern-

ing candidates and measures. Voting was to him a sacred performance.

Like his father and his brother, he never used tobacco, but unlike Angelo (who discarded vegetarianism before he left for Europe to study), he abstained from meat-eating until the end. But he never made propaganda for his practice, and even took a semi-humorous view of the creed of more zealous vegetarians than himself.

The European countries, whose charms he so often glowingly described, he never saw again; but he retained the most detailed recollection of what he had seen in Hungary and on his way to America, in his earliest childhood. Often urged to visit the old world, he always, gently but firmly, refused to entertain the idea. He had, however, vaguely planned to visit some of the larger cities of our West, to rejoice in their growth and progress.

Devoted to his relatives and a few life-long friends, and to influencing, in his own way, the young children in the family as he had moulded their parents, he passed the evening of his life, as he had passed all his days, in serene thought of beautiful and serious things and in full faith in the progress of mankind. He rarely stepped forth into the blazing light of publicity. Excepting his *Historical Reference Book* and a little *Reformed Primer*, on which he expended much labor and ingenuity, he drifted into his literary work rather than chose it, his father's connection with cyclopædias first marking out the road. Had he been able to follow his own inclinations, he would have chosen the pursuits of an engineer. Though at home in many fields of human endeavor, notably so in political economy, and a sound thinker on educational matters, he found his greatest interest in problems connected with railroads, shipping, and applied mechanics. Considering his slender mathematical equipment, he had some surprising glimpses of the possibilities of physics and mechanics. One speculation of this kind communicated orally, but in full detail, to a professor of mathematics in one of our leading universities, was pronounced by him to be an extraordinary *tour de force*.